THE DOCK & HARBOUR AUTHORITY

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Editorial

The Port of Rotterdam.

In *The Dock and Harbour Authority* of January, 1922, there appeared an article on the Port of Rotterdam, but much has transpired in the course of the past twelve years, and the various activities of the Port over this period are now recorded in another article which appears in this month's issue, and which has been written for us by the Director of the Port of Rotterdam, N. Th. Koomans, C.E.

Rotterdam, which is located at the mouth of the Rhine, is in every respect an ideal transhipment point for cargo passing to and from Germany, Alsace Lorraine and Switzerland, and this therefore accounts to a great extent for Rotterdam handling more cargo than any other of the principal ports in North-Western Europe. During 1933 the total quantity of traffic handled at the Port amounted to 22,820,000 tons, which was composed of 15,260,000 tons in transit traffic and 7,560,000 tons in domestic traffic, although naturally in common with other world ports, Rotterdam's traffic has decreased considerably within the last few years, as is shown by the fact that in 1929 the total traffic handled was 38,750,000 tons.

Since 1920 several developments have taken place in the Port of Rotterdam to enable boats of larger tonnage and deeper draught to enter the Port for the purposes of unloading and loading goods. The first project undertaken was the extension of the Waalhaven, construction on which was originally commenced in 1907. The Waalhaven is utilised as a bulk cargo basin, loading and discharging of goods being carried out by means of loading bridges erected on the quays and which, when lowered, reach across the ocean-going vessel, and come into position above the inland craft lying alongside her.

Another interesting development was the construction of the Merwehaven, which was commenced in 1927 and completed in 1931. The Merwehaven is situated on the right bank of the Maas, and comprises a series of three basins with one entrance, it being utilised for the handling of general merchandise. The Merwehaven now affords an additional quayage of 13,000 ft.

Other developments included the construction of a small dock for the distribution of gasoline; the construction of an oil dock with a water surface of 125 acres; improving the bridges connecting the two sections of the city; the extension of several ferry connections; improving railway connections on the various quays to the main line; improving the entrance to the Port; improving communications with inland waterways; and the laying out of areas for industrial purposes. The mechanical facilities for loading and unloading and sheds for storage purposes have also been augmented from time to time.

The progress that has been made in the Port of Rotterdam since the Great War has been considerable, and there is no doubt that when trade once again resumes its normal trend Rotterdam will be in a position to meet the requirements of whatever traffic may enter the Port.

£500,000 for Mersey Docks and Harbour Board.

Mersey Docks and Harbour Board has just issued £500,000 of 3½ per cent. redeemable stock 1975-85. In the prospectus announcing this issue it is stated that the Mersey Docks and Harbour Board was constituted as a Public Trust under Acts of Parliament passed in 1857 and 1858. According to the latest detailed figures issued by the Board of Trade giving particulars of the trade of the ports of the United Kingdom, Liverpool, is second only to London in the import trade, and is the first port in the Kingdom for exports which are the produce and manufactures of this country, and which mainly emanate from the North and Midlands. The magnitude of the undertaking can be gauged by the fact that under the borrowing powers conferred by the Board's various Acts of Parliament, the sum of £44,583,588 has been spent on its development to 1st July, 1933, the end of the last financial year. Of that amount £6,978,208 has been redeemed, leaving an outstanding debt of £37,605,380. The total revenue of the Board for the last financial year (ending 1st July, 1933) was £3,250,680. The proceeds of the issue will be applied in the repayment of outstanding bonds and debt, and as to any balance for new works and for developing the Dock Estate. The Estate vested in the Trust consists of about 2,046 acres,comprising thirty-eight miles of quays, and includes wet and dry docks, warehouses, lands, railways, and other property on the Lancashire and Cheshire sides of the Mersey. The net tonnage of vessels entering the port and the amounts received by the Board for rates and dues on vessels and goods for the past ten years are as under:—

Year ending 1st July	Total Tonnage	Amount of Rates and Dues. £
1924	18,574,144	2,461,012
1925	19,635,125	2,494,904
1926	19,171,701	2,450,843
1927	20,739,163	2,585,221
1928	20,158,500	2,456,048
1929	20,521,906	2,598,464
1930	21,314,820	2,523,217
1931	19,843,228	2,212,775
1932	19,080,728	2,196,239
1933	18,758,839	2,076,940

For the current financial year from 2nd July last until 1st of May, the total tonnage entering the port amounts to 16,489,420 tons, and rates and dues on vessels and goods amount to £2,056,761, as against 15,350,944 tons and £1,912,745 for the corresponding period of 1933. These figures show that Liverpool as a great port has shared in the depressed state of world trade, but the figures for the ten months ending 1st May, 1934, also show that Liverpool is participating in the improving conditions of trade.

The Port of Boston, Lincolnshire.

At the Lincolnshire Port of Boston a new riverside jetty and large tanks for the storage of oil are in course of construction on the south bank of the river and an additional shed has been erected on the riverside quay for the accommodation of traffic from small craft discharging alongside the new wall. A three-storey concrete shed 300 ft. by 50 ft. has recently been erected on the dock side and new hydraulic cranes are on order and are to be completed shortly. The imports at Boston last year included timber 86,532 loads and various merchandise 112,665 tons and the exports of coal, coke and general goods were 347,726 tons.

Improvements at Goole.

The work at the new entrance lock at Goole is proceeding steadily and the Aire and Calder Navigation have under construction a large closed-in transit warehouse which will greatly facilitate through traffic, particularly in the strawboard import trade which is assuming large proportions at Goole. The length is 300 ft. and the width 52 ft., and the capacity 1,300 tons of dead weight cargo. In addition there is an 8 ft. platform the full length outside for loading road vehicles. Provision is being made for electric cranes. The Aire and Calder have also introduced recently a new anti-breaker apparatus for shipping coal. This, so far, has proved highly successful and can deal with 600 tons per hour. A considerable quantity of scrap iron and old material now arriving at the port is being discharged by means of a new type of grab (the first of its kind to be used on the Humber) which handles it easily and enables vessels to be discharged rapidly. Goole is looking forward with intense interest to the approaching completion of the river works at Trent Falls and anticipates a great improvement in the navigable channel which will enable deeper vessels to use the port even on neap tides.

Port of Southampton Topics

Dock Statistics for May.

Southampton Docks statistics for May reveal a series of ups and downs, compared with the figures for May last year, but they show that the trade of the port has been maintained on a more or less steady basis.

The number of vessels inward fell from 279 to 266, and outward from 279 to 263, giving decreases of 13 and 16 ships respectively. Inward there was an advance of 122,886 tons gross, the figure mounting from 1,506,533 tons to 1,629,419 tons. But outward there was a decline of 78,895 tons, for the total for the past month was 1,450,450 tons, as against 1,529,345 tons during May, 1933.

The net tonnage returns show a similar state of affairs, for while there was an increase inwards of 36,908 tons, the total being 836,792 tons, as against 799,884, there was a fall outward of 57,863 tons, the total slumping from 808,021 tons to 750,158.

The volume of cargo handled during the month was less than in May, 1933, for although exports advanced by 3,002 tons, there was a drop of 11,562 tons in imports. The inward freight amounted to 39,722 tons, as compared with 51,284 tons, and outward to 26,493 tons, as against 23,491 tons a year ago.

The passenger returns show an increase of 1,087 in the number of outward passengers, but inward a decrease of 403 was recorded. The total number of passengers inward was 17,143, and outward 16,394.

Troop movements were also up, 2,152 arriving, as compared with 1,366, an increase of 786.

"Leviathan" returns to Southampton.

After a long absence from the North Atlantic service the "Leviathan," flagship of the United States Line, made a reappearance at Southampton in June.

Mr. P. A. S. Franklin, president of the International Mercantile Marine Corporation and head of the United States Lines, has stated that the return of the "Leviathan" will involve the Company in a loss estimated at £16,000 per trip.

This means that the five voyages which the liner is scheduled to make between now and September will cost the United States Lines somewhere in the region of £100,000.

The "Leviathan" has always been an expensive ship to operate, and she was withdrawn from service on that account, coupled with the fact that the volume of passenger traffic available was insufficient to enable her to pay her way.

The "Leviathan" made Southampton her terminal on this side of the Atlantic for a number of years, but now the United States Lines have decided to make Havre her terminal, where the scale of charges are presumably lower than those operating at Southampton. However, the ship will call at Southampton on all her west-bound voyages to New York, passengers being embarked by tender in Cowes Roads.

Port of London Notes

London's Shipping.

During the week ended June 1st, 1,041 vessels, representing 937,779 net register tons, used the Port of London. 563 vessels (748,996 net register tons) were to and from Empire and Foreign Ports and 478 vessels (188,783 net register tons) were engaged in coastwise traffic.

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During the week ended June 8th, 1,279 vessels, representing 1,117,558 net register tons, used the Port of London. 639 vessels (923,777 net register tons) were to and from Empire and Foreign Ports, and 640 vessels (193,781 net register tons) were engaged in coastwise traffic.

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During the week ended June 15th, 1,096 vessels, representing 1,054,544 net register tons, used the Port of London. 566 vessels (824,497 net register tons) were to and from Empire and Foreign Ports, and 530 vessels (230,047 net register tons) were engaged in coastwise traffic.

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During the week ended June 22nd, 1,072 vessels, representing 901,913 net register tons, used the Port of London. 595 vessels (724,446 net register tons) were to and from Empire and Foreign Ports, and 477 vessels (177,467 net register tons) were engaged in coastwise traffic.

Tilbury Passenger Landing Stage.

During the month of May, forty-five vessels, totalling 456,129 gross register tons, used the P.L.A. Tilbury Passenger Landing Stage.

Port of Halifax

Shipping.

During the month of April, 1934, a total of 408 vessels entered and cleared the Port of Halifax, as compared to 479 for April, 1933 and 490 for April, 1932. The net registered tonnage is reported at 881,307 tons, as compared to 647,165 tons for April, 1933 and 651,907 tons for April, 1932. The number of vessels engaged in the Trans-Oceanic service entering and clearing during the month of April, 1934, totalled 169, as compared to 128 for April, 1933 and 125 for April, 1932. The number of vessels engaged in the coastwise trade entering and clearing during the month of April, 1934, totalled 239, as compared to 351 for April, 1933 and 365 for April, 1932.

Since January 1st, 1934, the total number of vessels arriving and departing at the Port of Halifax is reported at 1,669, as compared to 1,668 for the same period of 1933 and 1,688 for the first four months of 1932.

Cargo Tonnage.

The total cargo tonnage handled inward and outward during April, 1934, is reported at 169,265 tons, as compared to 115,878 tons for April, 1933, and 128,235 tons for April, 1932.

Since January 1st, 1934, the total cargo tonnage handled inward and outward amounted to 843,326 tons, as compared to 541,532 tons for the first four months of 1933, or an increase of 58 per cent. It is also interesting to note that the total of 843,326 tons of cargo handled by vessels at the Port of Halifax for the first four months of 1934 constitutes an all-time record, exceeding the same period of 1933 by 58 per cent., 1932 by 48 per cent., and 1931 by 39 per cent.

Passengers and Mail.

The total number of passengers landed and embarked at the Port of Halifax during the month of April, 1934, is reported at 2,013, as compared to 1,463 for April, 1933. Since January 1st, the passenger traffic is reported at 9,132, as compared to 8,794 for 1933.

The quantity of mail handled during the month of April, 1934, is reported at 17,093 bags, as compared to 9,345 for April, 1933. Since January 1st, the mail traffic is reported at 73,223 bags, as compared to 66,744 bags for 1933.

Langley London Ltd.

In the announcement of Messrs. Langley London, Ltd., on page XIV. in this month's issue, there appears at the bottom of the page the names and addresses of their Agents abroad. In the address of the Belgium Agent, however, the last line should read 62, Place de Meir.

Bremen's Seaborne Shipping Traffic in March, 1934.

In March, 1934, total goods turnover in the Bremen ports was 428,874 tons, against 421,564 tons in February, 1934, and 383,656 tons in March, 1933.

Exports, in spite of the longer month, were, at 219,851 tons, 22,459 tons less than those of the previous month. An important factor in this was the decrease in export of coals and coke. Besides this the despatch of manures, cellulose, oils and fats, oil-cakes, etc., fell. This was not counter-balanced by the increase in shipments of stones and earth, iron and iron goods, grain, flour, timber, salt, etc.

Goods received in March, 1934, amounted to 209,023 tons, against 179,254 tons in the previous month. A certain increase was to be expected, due to the longer month, but that it is moreover a decided increase can be seen from the fact that in March 6,743 tons per diem were discharged, against only 6,402 tons per diem in February, 1934. Excepting grain, oils, and fats, also oil-cakes, nearly all goods showed an increase.

Goods imported in the first quarter of 1934, 612,948 tons, were somewhat lower than in the similar period of the previous year at 614,785 tons. The decrease is chiefly due to the fall in grain discharged as a result of the agrarian political measures of the Reichs Government. Besides this, timber, cellulose, fruit (southern and other) and rice showed a more or less considerable falling off. These decreases were almost counterbalanced by increased arrivals of metal, metal goods, stones and earth, mineral oils, coals and coke and wool.

Goods despatched in the first quarter, 723,068 tons, exceeded the similar period in 1933 at 280,036 tons. Besides coal and coke, shipments of stones, earth, manures, iron and other metal goods, grain and timber increased considerably. The extent also of shipments of vegetable spinning materials, yarns and twists, flour, fruit (southern and other), oils and fats, and wine exceeded those of the previous year. On the other hand, somewhat smaller quantities of cellulose and foodstuffs and luxuries, such as beer, coffee, cocoa, tea and tobacco, were despatched.

Compared with the last quarter of 1933, in which shipment via Bremen, due to ice difficulties on the Rhine and Christmas trade, was much favoured, the quantity of goods shipped in the first quarter of 1934 was only 23,666 tons less.

Notes from the North

Electricity on Dock Estates.

HOW electricity might be used to advantage on dock estates was mentioned by Mr. E. T. Williams, of London, in the course of a discussion on "Developing the Electric Power Load," at the annual convention held at Liverpool of the Incorporated Municipal Electrical Association. He knew of a large dock which was surrounded by steam cranes. From time to time the question arose—should they be electrified? The Chief Engineer said it was not an economic proposition because the cranes were not used enough to justify the capital expenditure that would necessarily have to be incurred, in effecting the change-over. Subsequently, a very careful investigation was made, and it was revealed that if any of the ships wanted to use the cranes they had to give several hours' notice in order that steam could be raised for them. It was pointed out that if the cranes were electrified they could be put into immediate use at any time without any preparation having to be made. The arguments for electrification won, said Mr. Williams. The most surprising thing of all was that by the cranes having become readily available for use, the demands upon them increased. People moving about ships, when they found they could get the service of a crane for the asking, did not hesitate to ask. The greater facility with which goods could be removed proved to be of immense general convenience, so much so that even the engineer had to admit that his previous view of the situation was wrong. It was found that the cost of running the cranes for a month was less than the cost of raising steam for one service for a day.

Birkenhead Bridge Tolls.

Birkenhead Corporation has appointed representatives to attend a conference with the Mersey Docks and Harbour Board and the Wallasey Corporation to discuss the proposal to free Poulton Bridge from tolls.

Retirement.

After forty-nine years' service with the Mersey Docks and Harbour Board, Mr. George Parr has retired. He began in the warehouse department as an apprentice in 1885, and was subsequently transferred to the staff of the principal accountant. For a number of years he has been a senior member of the staff of the department.

New Mersey Ferry Boat.

Wallasey Corporation is having a new ferry boat built, the "Royal Daffodil II.," to replace the first "Royal Daffodil," which saw service in the Zeebrugge raid.

The new ship is 156 ft. 3 ins. long on the water line, 46 ft. broad, and has a moulded depth of 13 ft. 5 ins. She will have a speed of twelve knots. The hull is divided by five watertight bulkheads transversely and two continuous water-tight bulkheads longitudinally, which will make her almost unsinkable. At the launching ceremony Ald. Stanley Atkin said probably in twelve months or two years they would require another ferry steamer, and he trusted that the order would be placed with Messrs. Cammell, Laird on their merits. The ferry-boats built at Birkenhead in 1910—the "John Joyce" and "Snowdrop"—cost a total of £39,000, but the "Royal Daffodil II." cost £5,000 more than the other two together.

Visit of French Dock Engineers.

A delegation of French dock engineers and harbour-masters, numbering about twenty, visited Fleetwood recently to inspect the methods of handling fish traffic. Three ports were selected for the tour, two for general shipping—Glasgow and Liverpool—and Fleetwood for the fishing industry. The delegation included M. P. H. Watier, counsellor to the docks and harbours of the French Ministry of Works, who was accompanied by Mr. H. C. Water, one of the L.M.S. interpreters; Mr. H. P. Pemberton, an assistant to Mr. Ashton Davies, chief commercial manager of the L.M.S.; Mr. John Wood, docks and goods superintendent at Fleetwood; Mr. R. J. Davies Colley, managing director of the Fylde Ice and Cold Storage Company, Ltd.; Mr. Richard Knowles, French Consular representative at Fleetwood, and Mr. B. Walker, resident engineer to the L.M.S. at Fleetwood. The harbour and slipways and machinery for dealing with the unloading and selling of fish and its dispatch to different parts of the country were inspected, and the delegates were particularly impressed with the manufacture of ice and its distribution from the factory of the Wyre Dock. The visitors were also shown the method of handling fish traffic. They said that their report would be considered by the French authorities on their return to France. Boulogne, it was stated, was deeply interested in the various sections of the fishing industry as it was the biggest fishing port on the Continent with a fleet of 130 trawlers.

Birkenhead and Floating Roadways.

Birkenhead Corporation Ferries Committee has resolved to give notice to the Mersey Dock Board to terminate the agreement between the Corporation and the Board in relation to the annual payment to the Board for the use of the floating roadways and bridges by ferry goods traffic.

Port of Chester.

At the annual meeting of the Chester Port Sanitary Authority it was reported that during the last year there had been a marked increase in foreign trade. No passengers entered the ports. The amount of shipping entering the port was given as follows:—Foreign vessels, 20; coastwise (including schooners and motor vessels), 1,345—total 1,365.

Decorated Dock Sheds.

On the occasion of the annual convention, in Liverpool, of the Incorporated Municipal Electrical Association, the delegates were entertained to a social function on the White Star M.V. "Georgic." Lying in the Gladstone Dock, the vessel was floodlit, and the sheds round about were transformed almost beyond recognition with flags, flowering plants and palms.

Isle of Man Harbours.

Eight thousand pounds is to be spent by the Isle of Man Harbour Commissioners on various constructional schemes. Of this sum, £2,000 will be spent on completing the work of strengthening and widening the south of Victoria Pier. Another item is £1,500 to complete the widening of the base of Victoria Pier. A sum of £2,000 has been voted for repairing the Peel Bridge which connects the east and west sides of Peel Harbour. It is proposed to re-build the bridge with a single archway of reinforced concrete and maintain it at its present level from the bed of the river. The other item is repairing the section of the Victoria Pier on the south side of the Arcade, where it was extended in 1913. It was built on concrete pylons, but in several places the steel has burst from the concrete with the result that this part is in a bad state of repair. The completion of the work will cost between £5,000 and £6,000.

The Receiver-General told Tynwald that in respect of the Swing Bridge, Douglas, out of the annual revenue of £1,600, about £1,200 was spent on upkeep and employees, etc. If tolls were done away with, that £1,200 had to be raised. The bridge would be free of interest and sinking fund in 1938.

Problems of Dam Building.

Mr. W. T. Halcrow, M.Inst.C.E., M.I.Mech.E., discussed some problems of the design of concrete dams with special reference to deterioration due to moorland waters at the annual conference at Birkenhead of the Institute of Water Engineers. He said the action of water on concrete surfaces had been made the subject of investigation and experiment by engineers for many years, and increasingly so since cement concrete had become more generally used for constructional work. The majority of the materials tested showed deterioration at the end of a year, and only one material was unaffected when examined after 11½ years' contact with the water. This material is aluminous cement. Some materials under test resist well for eight or nine years and then begin to fall off. This applies particularly to certain applied coatings.

"There is no doubt," he said, "that dams constructed of masonry have proved to be the best, but in this country the use of this material has become prohibitive, due to its increased cost; some cheaper medium, such as Portland cement concrete, has had to be substituted.

"Although cracks invariably appear in mass concrete structures, they do not as a rule reach proportions which can give cause for alarm; nevertheless, it is realised that these cracks are caused in incalculable stresses which are set up in the mass by temperature variations, and it is preferred to build a structure in which all of the stresses are known. So far shrinkage in a longitudinal direction only has beeen referred to, but it must be remembered that shrinkage also takes place transversely and vertically, though in these two cases it is not so apparent. Where cast-iron guides are attached to the face of a dam for control sluices or other purposes, it is necessary to make allowance for the vertical shrinkage.

"An ideal arrangement would be to devise a completely water-tight skin of non-corrosive metal which would be supported by concrete blocks. The late Mr. C. S. Meik adopted this method in the case of a coffer dam for a lock entrance to a dock. Inter-locked steel sheet piles were driven to form the water-tight medium and support was given by pre-cast concrete blocks set dry behind the sheet piling. The design proved to be effective and economical for the purpose, but for a permanent dam the steel sheet piling would be unsuitable as it is subject to corrosion."

Notes from the North—continued

Mr. Arthur Turnbull.

Mr. Arthur Turnbull, a former district engineer of the L.M.S. Railway Company, who died at Crewe recently, at one time made periodical surveys of the Mersey estuary and dock channels and of the fixing of buoys. In 1902 he measured the flow and direction of the Mersey tides and afterwards produced a chart and gave evidence in the House of Lords in connection with the new dock at Garston.

River Diversion.

A scheme to divert the river Fender and Birket into the Irish Sea, involving the construction of a pumping station at an estimated cost of £98,000, is at present under consideration. The various authorities concerned are to be furnished with details of the cost by the Birkenhead Borough Surveyor for their consideration.

Fleetwood Improvement.

The Ministry of Health and the Board of Trade are to be asked to approve a £17,000 scheme to transform the Fleetwood to Knott End ferry, which is owned by the Fleetwood Corporation. One of the most welcome features of the new proposal is to be the abolition of the long flight of steps necessary to join the steamer at Fleetwood during each low tide. A gradual slide with an incline of not more than one in ten will be substituted. New waiting-rooms with comfortable seating and other accommodation are included in the scheme. At the Knott End side of the river improved shelter and landing facilities are proposed.

New Mersey Ferry.

There are strong possibilities that the ferry service between Liverpool Landing Stage and Eastham, which has been discontinued for some years, may be resumed in the near future for the summer months. Bebington District Urban Council recently acquired the ferry, and have been in communication with the Wallasey Ferries Committee regarding the proposal.

River Bank to be Strengthened.

Manchester Corporation has decided to fortify the portions of the south bank of the Mersey at Wythenshawe. The work will be put in hand as soon as possible after the tenders have been considered. The scheme embraces two short stretches, one on each side of the Princess Road bridge. There has been no flooding there, but as the bank is crumbling and there is a tendency to silting, it has been decided to make these stretches safe against any weight of water.

Preston's Record.

The largest vessel that has ever docked at Preston, the Swedish tanker, s.s. "Nordanvik," arrived on the Ribble navigation recently. An interested crowd of onlookers, which included the chairman of the Ribble Committee, Ald. W. Lucas, the dock superintendent, Mr. J. G. Merriweather, and Mr. A. H. Howarth, the Ribble engineer, witnessed the tanker's arrival. The "Nordanvik" has brought a part cargo to Preston of 2,100 tons of spirit, the rest of her cargo having been discharged at Stanlow (Ellesmere Port). The vessel is 464.8 ft. long, has a beam of 59.3 ft., and net tonnage of 4,808, and a dead-weight of 12,000 tons.

Hull and the East Coast

Defence of Hull as a "Cheap Port."

A DEFENCE OF HULL as a "cheap port" was put forward by Mr. T. H. Stone at the annual meeting of the Humber District Association of Chartered Shipbrokers. Hull, for some reason or other, he said, appeared to be the cockpit of what he considered were unjustified and unjustifiable complaints from certain quarters, as to port charges, but he ventured to suggest that Hull and the other Humber ports compared most favourably with other large British shipping centres. In some instances Hull was much better both as regards despatch and general working conditions. He admitted, however, that there was a "snag" and that was the dry dock charges which he would like to see cheapened. He hoped that the efforts of the local shipping authorities would lead to some improvement in that direction.

Mr. Stone added that there was no doubt that Hull did compare unfavourably with the Tyne, Bristol Channel and elsewhere, where the dry dock charges were much cheaper; and he was convinced that the dry docks on the Humber would be more fully and regularly employed if the owners would fall into line and reduce their charges.

With regard to timber discharge at Hull, Mr. Stone stated that the dock authorities are closely co-operating with the timber and shipping interests with a view to speeding up matters and providing additional facilities. It is hoped that as a result the congestion at the Victoria Dock, which appears to be almost inevitable at the height of the timber importing season, will be materially reduced in the near future. More sidings and storage have been provided and other steps taken to secure more expeditious working. Shipment of the new season's goods from the Baltic and White Sea is now proceeding in earnest. During May numerous cargoes of sawn wood and pit props were received at Hull from Leningrad as well as from Swedish and Finnish ports. In view of the very large commitments of Hull and Grimsby importers a very busy season is again anticipated. Last year over a million loads of timber arrived at Hull alone and this may be easily exceeded ere the end of the present year. In the January-May period imports were much in excess of a year ago, a notable feature being the heavy increase in the quantity of Canadian wood.

Humber Conservancy Board: Pilotage Committee.

The Pilotage Committee of the Humber Conservancy Board have had under consideration suggested alterations in the financial and administrative organisation outlined and approved by the Executive Committee of the United Kingdom Pilots' Association. The conclusions that the Pilotage Committee have arrived at and which the Commissioners are submitting to the Board of Trade are in effect that the committee do not know why changes should be made in the means of administration and levying pilotage dues which at present operate in the Humber district. These, it is asserted, work with satisfaction to all concerned and no suggestion has been made that the administrative machinery lacks efficiency. It is added that the pilotage organisation on the Humber has been evolved out of many years of intimate local experience and close practical knowledge of the needs for which the pilotage services are required. The committee consider that the drastic changes suggested are such as must be wholly unacceptable. Not in the least degree do the committee know how the new proposals could advantage anyone (except perhaps foreign vessels), but, on the contrary, they believe that the proposals would add substantially and unnecessarily to the costs, result in complications and disputes, and displace a time-honoured system which has proved itself effective.

The proposals thus commented upon are embodied in a scheme put forward by the United Kingdom Pilots' Association, the main object of which is to superimpose on the pilotage rates proper a small compulsory contribution which would be payable in all districts by all ships, with certain exemptions to be agreed upon later, which leave the right to demand the services of the pilot. It is proposed that the net earnings of the pilots, if the scheme be adopted, shall be no more and no less than those for the year previous to the introduction of the scheme. This, it is contended, would allow the existing pilotage rates to be reduced by an amount which would be more than that of the proposed compulsory contribution to the total revenue. The burden would be spread over a wider field and more revenue would be obtained from foreign ships while the total cost to British shipowners would consequently be reduced.

New Coaling Appliances at Grimsby Nearly Ready for Use.

At Grimsby new coaling appliances at the Royal Dock are in an advanced stage and will be brought into use in the near future. They comprise four coaling points in addition to two lighter chutes, which work on the belt principle and are capable of shipping at the rate of 400 tons per hour at each point. The old grain warehouse on this dock has been leased to the Grimsby Cold Storage Co., Ltd., who have transformed it into a cold store, specially insulated and piped for maintaining a temperature of "minus five." At present there is capacity for the storage of 1,000 tons of perishables and ample room for extension when required. A conveyor has been erected from the dock side to the cold store.

Immingham Dock Statistics.

During the month of May, 1934, a total of 111 vessels, representing a net registered tonnage of 118,410, used Immingham Dock, including 11 vessels totalling 13,487 net registered tons using the Western Jetty coaling berth; as compared with May, 1933, when 107 vessels totalling 134,216 net registered tons used the port, including 18 vessels of 30,064 net registered tons using the Western Jetty.

New 15-ton Level Luffing Electric Crane erected at the Great Western Railway Company's Commercial Graving Dock, Bute Docks, Cardiff

Our illustrations show a fine new 15-ton Electric Level Luffing Crane which has just been erected and brought into use by the Great Western Railway Company at their Commercial Graving Dock at the Bute Docks, Cardiff.

The Commercial Graving Dock is 600 ft. long and has a width at entrance of 60 ft., and now that this new crane, which is the last word in modern crane practice, is available, the dock is one of the best-equipped dry docks in the Bristol Channel.

The crane has been erected on a crane track 400 ft. in length on the east side of the dock and alongside rail connections which are linked up with the Company's dock and main line railway lines. It will therefore be appreciated that this crane will be exceedingly useful to ship repairers and others requiring to lift heavy propellers, machinery, plates, etc., in connection with the repairing of vessels, and that it will considerably enhance the existing facilities at this up-to-date dry dock.

The crane has a radius of 51 ft., which is more than ample to span the centre of the dock. It is also fitted with the latest pattern level luffing gear whereby loads can be lifted and the crane luffed without varying the height of the load. It was constructed by Stothert and Pitt, Ltd., Bath, England.

The enterprise of the Company in providing this useful accessory to the docks will encourage the support of shipowners, ship repairers and others interested in the ship repairing business. The dry dock being a commercial one, owned by the Great Western Railway as the wet docks authority, it is available for shipowners to obtain the services of any firm of repairers they may select to carry out their work.

Launch of Two Portuguese Submarines

A double launch took place from the Barrow Shipyard of Vickers-Armstrongs Limited on May 30th, when the Portuguese Submarines "Golfinho" and "Espadarte" took the water. The "Golfinho" was launched by Her Excellency the Portuguese Ambassadress Dona Genoveva de Lima Ulrich and "Espadarte" by Madame de Brion, whose husband is Chief of the Portuguese Submarine Inspection Commission at Barrow.

His Excellency, Dr. Ruy Ennes Ulrich and their daughter accompanied his wife to Barrow. General the Hon. Sir Herbert A. Lawrence, G.C.B. (Chairman of Vickers Limited and Vickers-Armstrongs Limited) and Commander C. W. Craven (Managing Director of Vickers-Armstrongs Limited) represented the Builders, and the Admiralty showed their appreciation of the happy relations that exist between the British and Portuguese Navies by appointing Rear-Admiral C. P. Talbot, C.B., D.S.O. (Director of Naval Equipment), to attend as their Official Representative. There were also present a large number of Portuguese, British and Brazilian Naval Officers, and Portuguese Army and Air Force officers and the higher officials of the Barrow Works and their wives.

General Lawrence presided at the luncheon following the launch, and after the toasts of the King, the President of the Republic of Portugal and the President of the United States of Brazil, he proposed the toast of the "Golfinho" and the "Espadarte," and presented Her Excellency the Portuguese Ambassadress, Dona Genoveva de Lima Ulrich and Madame de Brion with souvenirs. In the course of his remarks he said how pleased he was to welcome the Ambassador and his wife, Captain D'Almeida Henriques (the senior Portuguese Naval Officer in England), the Head of the Portuguese Military Commission, and Rear-Admiral C. P. Talbot, C.B., D.S.O. (Official Representative of the Admiralty) to Barrow. He pointed out the "Golfinho" and "Espadarte" were respectively the 165th and 166th submarines to be launched from the Barrow Yard, which he believed was an achievement not equalled by any other company in the world, and he hoped that the firm's long experience in the construction of this type of ship would ensure that the vessels just launched would give entire satisfaction to the Portuguese Government. General Lawrence pointed out that Portugal and Britain had much in common. They were both maritime countries, had produced many famous navigators, and had been allies for a very long time. He complimented Portugal on the great economic strides that had been made under the present Government. Sir Herbert referred to economic conditions in Britain. He was not without hope that the policy of economic isolation amongst the nations was gradually giving way to a spirit of co-operation, and with this co-operation he was confident world trade would steadily improve.

His Excellency, Dr. Ruy Ennes Ulrich, in his reply, emphasised that the increase now being made in the naval and military forces of his country was not with any aggressive intention. He was happy to say that their relations with their immediate neighbours were very good. The increase was the natural effect of improved economic and social conditions. He regarded adequate naval and military forces as the most important factor in ensuring peace. His Excellency referred in terms of gratitude to the help the British Admiralty had extended to his country in the training of the submarine officers and crews, and he also spoke of the friendship that existed between Portugal and Brazil. He referred to Vickers-Armstrongs as a company known throughout the world for its magnitude as well as for its efficiency and fair dealing.

Rear-Admiral C. P. Talbot congratulated the Portuguese Government in placing orders for their ships in this country. He had had a great experience of Barrow-built submarines, and he was sure the vessels now being built would be a great success.

Aden Port Trust

The returns of shipping using the Port of Aden for the month of April, 1934, are as follows:—

	No.	Tonnage
Merchant Vessels over 200 tons ...	137	596,404
,, ,, under 200 tons ...	—	—
Government Vessels	8	12,664
Dhows	163	5,201
PERIM.		
Merchant Vessels over 200 tons ...	23	69,300

The total value of imports, excluding Government Stores, was Rs.48,24,000/-, as compared with Rs.40,07,000/- for April, 1933, and of exports Rs.20,81,000/-, as compared with Rs.23,68,000/-.

The total value of both imports and exports together was Rs.69,05,000/-, as compared with Rs.63,75,000/- for the corresponding month last year.

Imports during the month were above those for April, 1933, in the case of coffee, grain, pulse and flour, gums and resins, raw hides, raw skins, sugar, white and printed or dyed piece goods and manufactured tobacco; and below in the case of hardware, seeds, grey piece goods, twist and yarn, unmanufactured tobacco and private treasure.

Exports were above those for April, 1933, in the case of grain, pulse and flour, gums and resins, hardware, raw hides, sugar, manufactured tobacco and private treasure; and below in the case of coffee, seeds, raw skins, grey, white and printed or dyed piece goods, twist and yarn and unmanufactured tobacco.

TRADE OF THE PORT.

Article.	Unit	Imports.		Exports	
		Quantity.	Value Rs.	Quantity.	Value Rs.
Coal	Tons	3,609	72,482	0	0
Coffee	Cwts.	8,171	2,43,113	5,671	1,93,357
Grain, Pulse and Flour	,,	75,424	3,13,594	44,990	1,82,699
Gums and Resins	,,	5,953	96,917	4,684	1,17,969
Hardware	—	0	18,973	0	21,213
Hides, raw	No.	1,758	2,162	1,556	1,285
Oil, Fuel	Tons	75,390	18,84,750	0	0
,, Kerosene	Gls.	48,124	31,273	2,916	2,382
,, Petrol	,,	26,000	25,167	1,040	1,270
Salt	Tons	0	0	12,800	1,38,600
Seeds	Cwts.	2,609	21,597	298	3,030
Skins, raw	No.	470,725	2,19,941	408,949	2,86,461
Sugar	Cwts.	31,650	1,61,927	23,264	1,19,203
Textiles—					
Piece Goods, Grey	Yds.	2,345,330	2,79,013	2,258,540	2,85,167
,, ,, White	,,	663,308	87,896	203,170	34,468
,, ,, Printed or Dyed .	,,	950,678	1,76,672	770,202	1,52,665
Twist and Yarn	Lbs.	108,050	52,624	100,253	47,182
Tobacco, Unmanufactured	,,	294,420	87,913	75,180	13,730
,, Manufactured	,,	99,388	84,968	28,829	23,063
Other Articles	No. of Pkges.	50,894	8,46,515	18,426	3,25,361
Treasure, Private	—	0	1,16,291	0	1,32,103
Total ...	—	—	48,23,788	—	20,81,208

The number of merchant vessels over 200 tons that used the port in April, 1934, was 137, as compared with 127 in the corresponding month last year, and the total tonnage was 596,000, as compared with 581,000.

Excluding coal, salt, fuel oil and Military and Naval Stores and transhipment cargo, the total tonnage of imports in the month was 10,900 and of exports 6,000, as compared with 8,400 and 5,200 respectively for the corresponding month last year.

Development in Coastwise Shipping

References to impending improvement in the demand for transport, due to the encouragement of internal trade, were made on board the Port of London Authority's yacht " St. Katharine" on Tuesday, June 12th, on the occasion of a visit by Members of Parliament to wharves, warehouses and ships engaged in London's coastal shipping services.

It was stated by Lord Ritchie, of Dundee, Chairman of the Port of London Authority, that there are now more than seventy regular coastal liner services between London and other ports of the United Kingdom.

" To my mind," he declared, " nothing but good can accrue from the tendency which has been manifest during recent months to view transport, not in the light of a number of competing and conflicting units, but as a vast homogeneous service, every branch of which fulfils an essential function and is entitled to carry on its work on a fair economic basis.

" At a time when every transport unit should be used to the best advantage in rebuilding the commercial fortunes of Britain, we cannot afford to take sectional views, and no plan to rationalise transport can be successful unless it takes due cognizance of coastwise shipping."

Never Better Prepared.

Sir John Sandeman Allen, M.P., Chairman of the Coastal Trade Development Council, under whose aegis the visit was organised, said that the fact that coastwise shipping was improving while overseas shipping continued to suffer from world trade depression aggravated by subsidies and artificial restraints, was a direct result of the encouragement of our domestic trade, and was symptomatic of the future trend of trade.

He foresaw a further steady improvement in domestic trade, and it said much for the enterprise of coastal shipping companies that in the building of ships, the improvement of handling and storage facilities, and the creation of highly efficient shore organisations for collecting and distributing cargoes, they stood to-day better prepared than ever for taking advantage of the trade revival which loomed ahead.

Sir John concurred in Lord Ritchie's view that in the broad conception of transport as one great national service lay the hope of future prosperity for all its branches. " Nothing but disaster can result from wasteful, uneconomic competition," he declared, " and in the setting up of the Transport Advisory Council I foresee the beginning of a new era of rational transport organisation, which will have a marked influence in restoring the fortunes of every section of the industry."

Seaborne Goods Traffic of the Weser Ports.

Sea-borne goods traffic of the Weser Ports in April, 1934, at 488,600 tons, was 22,400 tons, or 5 per cent. greater than in March. Almost the entire increase fell to imports, which amounted to 261,100 tons. These rose by 21,600 tons, or 9 per cent. Particularly supplies of mineral oil, piece-goods, rice, bananas and ore have risen. Arrivals of cotton, as well as coals, timber and oil seeds were weaker. Exports at 227,500 tons, exceeded the previous month only slightly (plus 800 tons) and more coals were carried; furthermore, grain was shipped. Potash salts and iron, on the other hand, decreased. Compared with April, 1933, traffic showed a considerable improvement; for it was 158,100 tons, or 48 per cent. larger.

During the first four months of the year 1,896,800 tons were imported and exported, compared with 1,574,800 tons in the same period of the previous year. Traffic was thus 322,000 tons, or 20 per cent. greater. The increase falls to exports, which, at 992,400 tons, were 346,000 tons, or 54 per cent. higher, while imports, which at 904,400 tons, were still 24,000 tons, or 2½ per cent. less than in the previous year.

North-East Coast Notes

Strength in the Coal Trade.

THE coal trade of the North-East coast—upon which all the other industries are to a greater or lesser extent dependent—continues in a very satisfactory condition, although we are at a season of the year when the domestic demand is only meagre. So far on the Tyne this year, the shipments have increased by 500,000 tons. On the Wear the four months' figures, 1,366,053 tons, are 19,740 tons above the corresponding period of 1933, while other exports are 6,400 tons higher. At Blyth, the figures so far for the four months at 2,109,677 tons, show an increase of 18 per cent. on the previous year, which was a record period.

Mr. R. S. Dalgliesh, chairman of the Docks and Trade Committee, speaking at the May meeting of the Tyne Improvement Commission, said the increase in coal shipments continued, and there was continued improvement in the export trade. Of the 500,000 tons increase 75 per cent. was in respect of shipments overseas. The Commissioners docks and staiths contributed 25 per cent. of the increase. Bunker coal shipments were better by nearly 50,000 tons. Imports and exports of general merchandise from January 1st to March 31st showed up well, increased trade being shown in most instances. In the imports, cement at 19,704 tons was up 4,180 tons; sugar at 10,566 tons was 1,950 tons higher. Iron ore at 70,494 tons showed an advance of 13,245 tons; other minerals at 47,061 tons showed an increase of 20,490 tons, and wheat at 43,476 tons was 1,691 tons up. The only notable decrease was a drop of 10,322 tons in oil fuel at 4,189 tons. In the exports, chemicals at 13,517 tons were up by 5,975 tons; steel manufactures at 6,471 tons were higher by 5,148 tons; lead goods were 1,324 tons up at 7,223 tons, and oil bunkers were 3,844 tons higher at 7,817 tons.

Official Salaries Restored.

Mr. Francis Priestman, in submitting the report of the Finance Committee to the May meeting of the Tyne Improvement Commission referred to the temporary abatements in the official staff salaries which had been in operation over two years. In the last six months the trade position, both local and national, had shown improvement. The Finance Committee had come to the conclusion that the time had arrived when the Commissioners should say that they did not expect or require that the voluntary reductions should be continued. He hoped the Board would confirm this recommendation. Dealing with revenue receipts, Mr. Priestman said April had followed the previous three months and showed an increase. The revenue for the four months was £14,000 better than in the corresponding period of last year.

Mr. R. S. Dalgliesh proposed that the matter be referred back for further consideration. In 1932 the Commissioners had, he said, a surplus of £578, and last year there was a loss of £20,000. They required £50,000 extra revenue this year to meet the loss of last year and what was required for this year.

In answer to a question, the Chairman (Mr. Everett) said the restoration of cuts represented £1,400 in a full year.

There was no seconder for Mr. Dalgliesh's amendment, and the report was carried.

Quick Loading at Tyne Dock.

A smart loading feat has been effected at Tyne Dock. The steamer "Lorca," owned by F. Strick and Co., Newcastle, began loading at No. 1 pier at 7 a.m. on May 22nd, and completed the work at 5.50 a.m. next morning, after taking on board 8,000 tons of coal in cargo and bunkers from the Holmside and South Moor Collieries in under twenty-three hours.

Sunderland's New Quay.

Although Sunderland's new Deep Water Quay is not as yet actually completed—the warehouse, for instance, being yet to finish—it has been brought into use, for the steamer "Loch Katrine" had the distinction at the end of May of taking on board the first cargo to be loaded alongside. To mark the occasion a civic luncheon was held on board the vessel. The Mayor, Councillor E. W. Ditchburn, who presided, said it was a pleasure to welcome the "Loch Katrine." The quay was expected to play a big part in the commercial revival of Sunderland, for which they had waited so long. "In considering the future of Sunderland, the Corporation and River Wear Commission, who have jointly sponsored the construction of the new quay, held that it was necessary for the well-being of the town that steps should be taken to improve and increase the facilities for general trading. As a result they are spending £400,000 on the construction of the quay and warehouses, and we are hoping that it will be money well spent and that the quay will meet with the success such a courageous effort deserves."

The Mayor added that to secure the visit of such a vessel as a Royal Mail liner to inaugurate the quay was a happy omen for the future, and he hoped that the "Loch Katrine" would be the forerunner of many more such visitors. He also hoped that the Royal Mail Line would find it profitable to send their vessels, which was undoubtedly the keyport and distributing centre for the County of Durham, with its huge population. "It would require," he continued, "considerable effort, even in normal times, with industry and commerce in full swing, to build up a large general trade in a port which has been known simply for its coal trade, but in times like these it is more than ever a courageous gesture. With the shipping facilities you have seen here to-day in operation for the first time, a quay accommodating the largest ships, situated only a few minutes from the open sea and fitted in the most up-to-date manner, it should be an aim not altogether beyond our reach."

Captain Cooke, of the "Loch Katrine," replying, said he had no difficulty in coming in, the entrance was good and everything had been put in his way to make a successful entry. "Your quay, which I can scarcely praise enough, is one of the finest I have ever laid at, and I have laid at some very fine quays in my time, including the new quay at Southampton which everyone is talking about. It is miles longer than this, of course, but it has not a single thing in the way of shipping facilities more than your quay here can offer."

Tees-side Development.

Mr. H. B. Toy, in his address as president at the annual meeting of the Tee-side Chamber of Commerce, said he believed that Tee-side was at the dawn of a new era in which he foresaw the establishment of new industries. To some extent it was even now occurring. New steels were being produced, which were being used in enormous quantities in the manufactures of motor vehicles and aircraft. Insufficient was known of these developments, but they might hope to see many of the finishing trades erecting plant on Tee-side. Production of iron and steel had greatly increased since March last year, and there were now twenty-eight blast furnaces in operation, compared with eighteen.

A marked improvement in the shipments of iron and steel from the River Tees was shown in May, an increase of 15,041 tons being reported. The total shipments during May at 54,912 tons was the highest since April, 1931.

Tyne Improvement Commission.

The Tyne Improvement Commissioners have recently issued a very attractive folder showing the advantages of the River Tyne as a bunkering port, and included in this folder is a drawing of the River Tyne from its entrance at the North Sea right up to the Derwenthaugh Staiths, showing the various coal shipping staiths and oil fuel berths that are available on this stretch of the river.

The Tyne Improvement Commission also point out that their port dues are at pre-war level on vessels calling for bunkering only, and that vessels can enter, bunker and leave the port at any state of the tide. Loading can also be continued up to 10 p.m. on Saturdays, when necessary, to enable vessels to complete bunkering.

At the Commissioners' Coal Shipping Staiths in the River at Whitehill Point the largest class of vessel can be loaded, as there are three berths dredged to 30 ft. at L.O.W.S.T.

On the back of the folder there is also shown Newcastle's position in relation to most of the larger ports throughout the world.

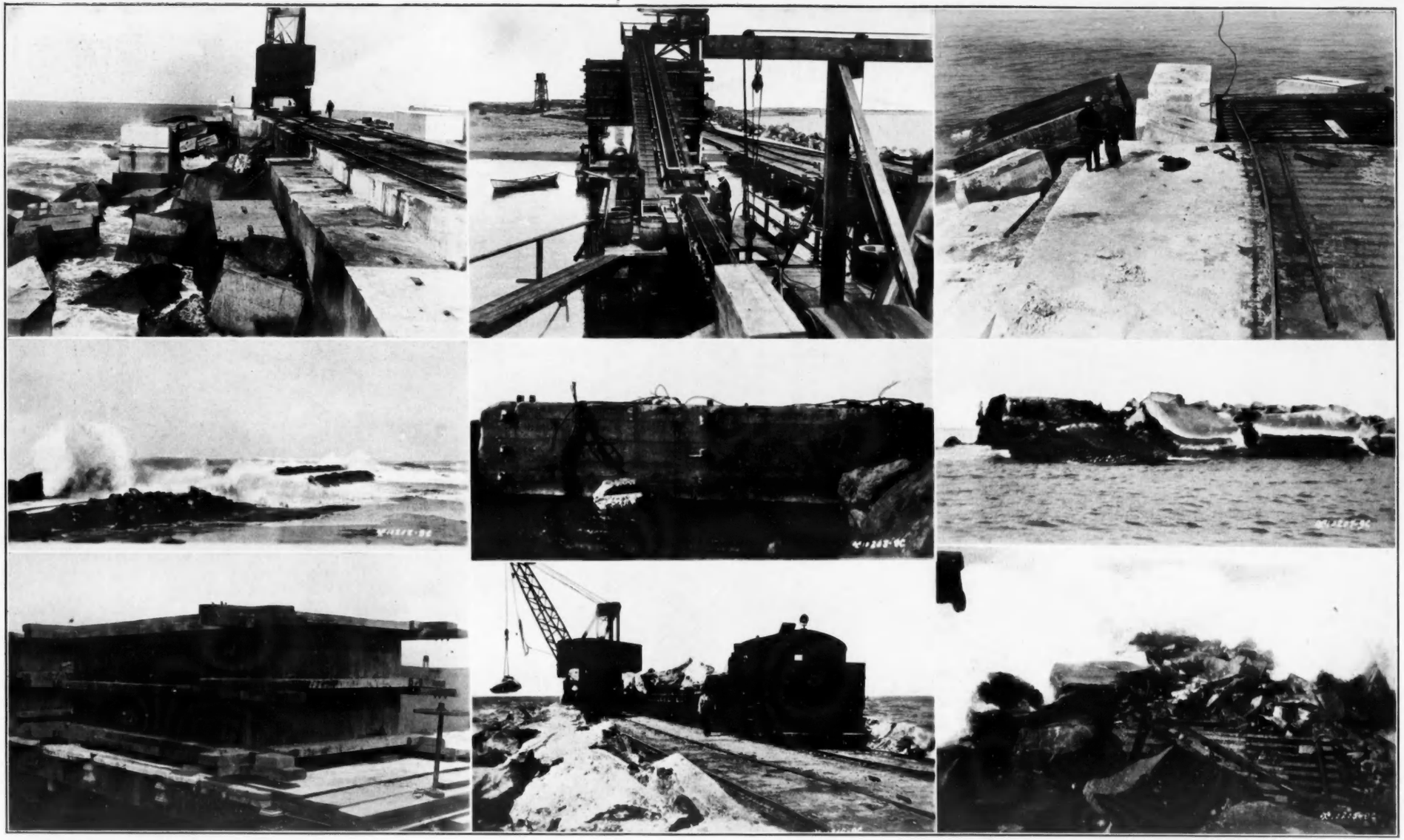
Tenders Invited

Three Ferry Boats required for the Argentine

The Commercial Counsellor to H.M. Embassy at Buenos Aires reports that the Department of Navigation and Ports is calling for tenders, to be presented in Buenos Aires by the 9th August, 1934, for the supply of three Diesel-driven ferry boats for the transport of passengers and motor vehicles. Overall length 37 metres, draught 1.30 metres. Beam at water line 9 metres, speed 18 kilometres per hour.

Firms desirous of offering boats of United Kingdom manufacture can obtain the further details of this call for tenders, together with particulars of the "Special Register" service of information, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1. Reference number A.Y. 12430 should be quoted.

Humboldt Bay Jetties



Top—Photo 19—Sea face of South Jetty in 1932, showing use of 20-ton pre-cast concrete blocks as riprap.

Centre—Photo 11—Seas breaking on North Jetty, Oct., 1924. Further inshore loaded standard flat cars of stone were lifted from rails.

Bottom—Photo 17—Wooden forms for casting 20-ton concrete blocks used in lieu of large stone. Two blocks, placed on a flat car, were aged for 3 to 7 days and then placed on slope as riprap. Iron plate used as bottom of form. Note design. Form was quickly dismantled by knocking wedges from between horizontal members and cleats.

Top—Showing belt conveyor, incline and hopper for unloading and storing sand and gravel. South Jetty in 1932, alongside of car-ferry unloading apron.

Centre—Photo 21—40-ton concrete monolith reinforced with railway rails. Several of these were rolled over the outer end of the North Jetty in 1924 and were lashed together with wire cable. These afforded some protection for a time, but within a year all were displaced, one being torn from its lashings and deposited 80 ft. north of its original position and on 10 ft. higher level.

Bottom—Placing stone on North Jetty on calm day.

Top—Photo 23—Outer end of South Jetty in 1932, shortly before rehabilitated jetty crown was joined with old monolithic jetty-head, first placed in 1915 and recapped in 1926 after settlement of original monolith.

Centre—Photo 15—South Jetty, Sept., 1927. Tide + 3.5 ft. Ocean side of outer end of enrockment, showing settlement of wing blocks.

Bottom—Photo 12—End of North Jetty, after heavy sea in 1924. Large stones in foreground (across track) weighed 12 to 18 tons. These were displaced from "parapet" erected along exposed side to protect men and machinery.

The Humboldt Bay Jetties

By Lieutenant-Colonel HENRY A. FINCH, Corps of Engineers, U.S. Army

(continued from page 253)

Humboldt Jetties. Crane equipped with sounding platform on outrigger 130-ft. long. Used for taking cross-sections.

In 1920, due to the high rates charged by contractors for barge deliveries to the north jetty, it was decided to invest $10,000 in a 4-mile extension of the standard gauge rail line from the construction camp up the north spit to connect with an existing commercial line. This was constructed in 1921-22. The high winds and drifting sand made its maintenance expensive for a few years. Fences designed to check the drift were relied upon until vegetation could be secured to serve this purpose. A shrub of the lupin family was found to be satisfactory, and the end of the spit is now covered with this growth. The south jetty is not accessible to rail connection.

At one stage of this period the original shore protection works at the root of the north jetty, which had been well demolished and buried in sand, were again uncovered and attacked by erosion. This threatened to cut the connection between the enrockment and the spit, necessitating the prompt renewal of 2,500 ft. of rubble-mound wall at a cost of about $120,000.

During a typical year—June, 1924—June, 1925—462 ft. of concrete cap and 42,000 tons of stone were washed out of the north jetty. Four thousand tons of stone were recovered and replaced.

A hard fight had to be waged to carry the north jetty out over its final 500 ft. (Photos 10, 11, 12 and 13), but this battle was won in 1925, and a monument, in the form of a monolithic jetty-head, weighing 1,050 tons, was erected on the battle-field.

During the period, 1917-1925, the entrance channel maintained a depth of from 24 ft. to 27 ft. at mean low water. The distance between the 30-foot contours on the outer and the inner sides of the bar was reduced from the 3,500 ft. prevailing in 1911 to about 800 ft. in 1925-26.

While the battle was being won on the north jetty, matters were not going well on the southern " front." In 1925 it was necessary to restore about 2,200 ft. of the enrockment from the origin to the stem of the jetty proper. Work was then vigorously pushed in 1926, and in February, 1927, the last stone was placed under the reconstruction project. The original 950-ton jetty head of concrete, placed in 1915, which had settled badly, was crowned with another monolith; two other crown blocks, about 30 ft. long and 14 ft. thick, were placed immediately inshore of the new jetty-head. This made the outer 100 ft. of the structure into a solid concrete mass down at least to the plane of low tide.

On each side of the concrete crown there were placed monolithic " wing " blocks, 30 ft. square on the surface and from 7 ft. to 8 ft. deep. Based on rubble-mound enrockments, the wing blocks were originally poured with their top surfaces horizontal and flush with the top of the crown block. It was expected that as the foundation washed away from the outer edges of the blocks, the outer part would settle, leaving the inner edges on a higher elevation. The event has proved this theory to have been sound. The wing blocks have settled in all cases (Photos 14 and 15), and half of them have taken the desired position with a minimum of separation from the main structure. In this position they act as a highly efficient protection for the rubble foundation of the crown block.

Photo 13. Humboldt Jetties. North Jetty, outer end, Channel side, looking seaward. Cap being undermined. November, 1925. At the outer end the Channel side of North Jetty is the exposed side, since storms commonly come from South-West.

Humboldt Bay Jetties—continued

In some cases the wing blocks "went to sea," having moved away from the main enrockment, in the act of settling, to such a distance that much of their effect as buttresses and shields has been lost (Photo 16).

The original monolithic head of the south jetty had served the purpose of stopping unravelling at the end of the enrockment so long as the block stayed at a high enough elevation. On more than one occasion, however, the waves breached the enrockment just shoreward of the head (Photo 8). The additional crown blocks and wing blocks, placed in 1926-27, were designed to prevent this destruction. Up to the present they have served this purpose—although they have required some aid in the form of place concrete or pre-cast blocks to fill the gaps between them and the crown block.

The same combination of crown and wing blocks was installed on the outer 100 ft. of the north jetty with quite successful results. Here, also, was tried the experiment of increasing to 7 ft. the thickness of the concrete cap over one section of the outer end where the thin cap and the enrockment had been repeatedly lost during reconstruction (Photo 2). The theory in this case was that the concrete slab, on being undermined, would break off in pieces of 50 to 100 tons, and thus aid in stopping the disintegration of the core. The undermining of the cap to such an extent has not occurred sufficiently to test this theory.

Photo 14. Humboldt Jetties. South Jetty. Channel side of enrockment near outer end, showing part of monolithic jetty-head and two outer wing blocks. Crown block is 14-ft. thick, wing blocks 8-ft. Tide +.2.

The reconstruction, extending over the years 1912-27, cost $4,895,000, of which $2,524,000 had gone for maintenance. This total checks well with the original estimate of $5,100,000, including a maintenance item of $1,900,000. Adding the $2,179,000 covering the original first cost of the jetties and maintenance between their completion in 1899 and the start of the reconstruction in 1912, the grand total is $7,074,000, distributed over 38 years.

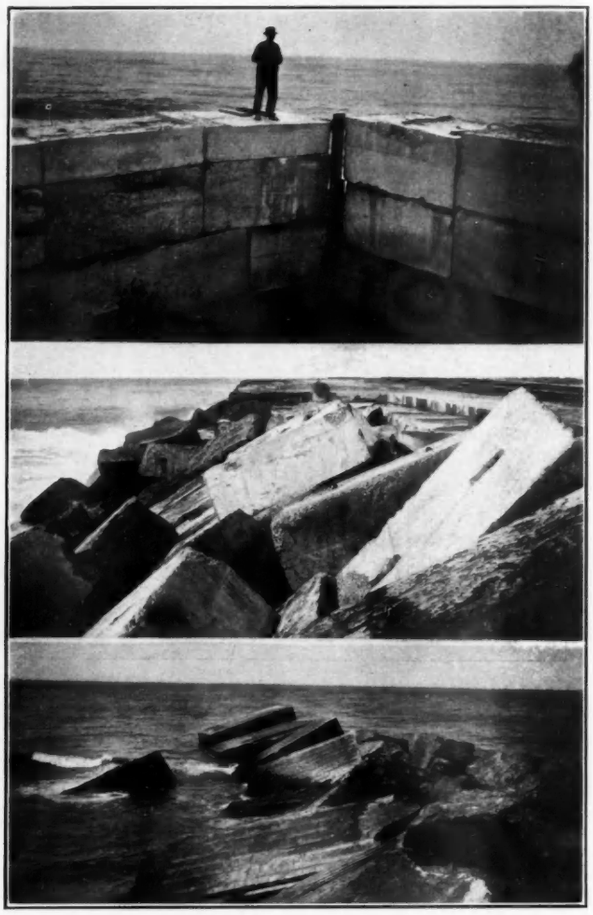
During the latter years of the reconstruction period the commerce of Humboldt Bay reached 600,000 tons annually, valued at about 18 million dollars. The channel serving this commerce was about 27 ft. deep at mean low tide. In 1927 the outer and inner 30-ft. contours on the bar were only 30 ft. apart.

In 1925-27 stone prices attained a new high level—$3.62 per ton, delivered to the jetty landing or siding. The records show that placing cost an additional 60 cents to one dollar per ton.

The structures continued to demand maintenance during the years 1927-32. This was particularly heavy on the south jetty where the three crown blocks, totalling about 100 ft. in length, had by 1930 settled badly, and where the six wing blocks originally flanking them had separated too much from the main enrockment (Photo 16). Extensive repairs were carried out in 1931-32, involving re-capping the two inshore crown blocks and the installation of additional crown blocks, as well as new wing blocks on the south face—all of monolithic concrete construction.

Repairs to the north jetty were not so extensive, although an emergency application of 1,200 cu. yds. had to be made to it in 1931 to prevent a break through the outer end. The wing blocks behaved very well on this structure, settling uniformly to their inclined positions. The wedge-shaped gaps between these blocks and the crown monoliths, created by this settlement, were filled in 1932 with place concrete.

The maintenance of the jetties having progressed to the point where only the largest stones were required for plugging holes in the armour, it became increasingly hard to secure such segregated material at reasonable prices. Consequently, in 1931-32 recourse was had to pre-cast, brick-shaped concrete blocks as a substitute for armour stone. These blocks were 9½ ft. long, 6½ ft. wide, and 4½ ft. thick, and weighing about 20 tons each, were cast in wooden forms so designed as to be easily removable and sturdy enough to be used repeatedly (Photo 17). When the blocks were to be put into service quickly, the forms were assembled on flat cars, two to the car, and filled from an elevated stationary mixer. An oiled sheet-iron plate was used for the bottom of the form, and the block was fitted with two ring-bolts at the top. Later, when the blocks were poured for storage in the yard, the forms were placed on a dampened sand foundation and filled from a mixer mounted on a flat car. An approximate 1 : 3 : 6 mix was used throughout for these "bricks" as well as for the crown and wing blocks poured in recent years.



Top—Photo 18. Showing use of concrete blocks in building forms for monolithic crown and wing blocks, 1931-32.

Centre—Improving Humboldt Harbour and Bay, California. South Jetty, March 21st, 1932. Tide 4-ft. Ocean side looking seaward from about station 88 + 00. Showing completed crown section and side slope.

Bottom—Photo 16. Showing demolished crown of South Jetty (placed in 1926) before rehabilitation in 1932. Note detached wing block on left.

On account of wave wash, it was found desirable on all exposed concrete work to use calcium chloride at the rate of 10 lbs. to the barrel of cement. None of the concrete has shown any tendency to disintegrate under exposure to sea water or wave action.

The brick-shaped blocks have proven most useful in building up forms for the crown and wing monoliths, but their main purpose was for riprapping the slopes of the two enrockments (Photos 18, 19 and 20). Many hundred were so employed, and they have proven as satisfactory as stones of equal weight would have been. They cost from $4.50 to $7.00 per ton, depending upon the season's output. These rates also apply to the crown and wing blocks.

The bank-run, sand-and-gravel aggregate used for this concrete contained much sand. This has apparently had no adverse effect on the monoliths, but the 20-ton blocks have, in many cases, spalled on the edges and corners under the enforced rough handling given them, but once in place they have served their purpose admirably. This is not to say that they have not been moved about by the storm waves; shifting has occurred particularly on the exposed slope of the south jetty, but this has not been sufficient to jeopardise the structure. Short of 1,000-ton monoliths there appears to be no baulking the waves of the so-called Pacific in this region. In

Humboldt Bay Jetties

Photo 22. Humboldt Bay Entrance Channel, 2,100-ft. wide. January, 1934. South Jetty on right. Such calm days are rare.

Photo 23. Humboldt Jetties. South Jetty in January, 1934. Outer 3,000-ft.

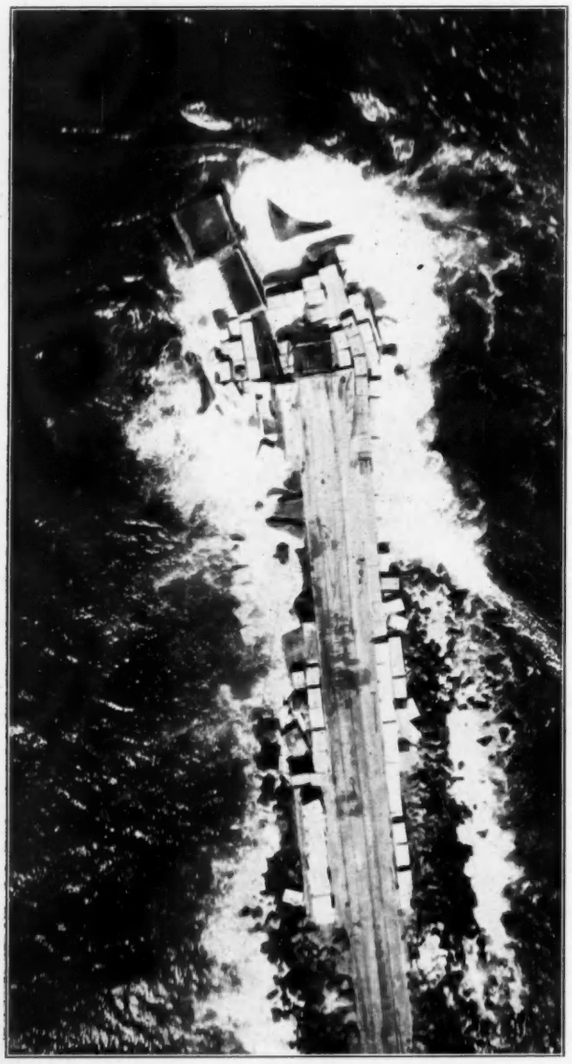
Humboldt Bay Jetties—continued

Photo 25. Humboldt Jetties. South Jetty in January, 1934. Photo is handicapped by heavy shadow of superstructure. At extreme outer end note joining of crown, reconstructed in 1931-32, with crown built in 1926. Old crown blocks are used as buttresses on southern face of new crown. Slopes are partially riprapped with 20-ton concrete blocks.

1924 five 40-ton reinforced concrete blocks were thrown over the end of the then incomplete north jetty enrockment and were lashed together with heavy wire cable (Photo 21). During the ensuing winter, two of the group were shifted by storm waves, one being moved 80 ft. horizontally and 10 ft. vertically from its appointed station.

In the past year no work has been called for on maintenance for the Humboldt jetties. The structures are at present in very good condition (Photos 22, 23, 24, 25 and 26), and the channel which they control has provided a uniform depth of 27 ft. at mean low tide.

Since the completion of the reconstruction project in 1927, maintenance charges on the two jetties have amounted to $563,000, and the total expended on them to January 1st, 1934, is $7,637,000, this sum having been distributed over 46 years.



South Jetty at entrance to Humboldt Bay, taken in 1932 from 1,000-ft. elevation, showing rehabilitation of Jetty in progress, consisting of placing concrete monolithic coping on crown of Jetty and riprap of pre-cast concrete blocks (20 tons in weight) on side slopes of old enrockment that had broken down. The dark-coloured blocks at the end of the structure are concrete monoliths which formed the former Jetty-head.

Conclusions.

There are many conclusions to be drawn from the forty-odd years of experience that the United States Army engineers and their Civil Service associates have had with the Humboldt Bay jetties. A brief reference only will be made to them here, since construction men and engineers familiar with work of this character are competent to form their own conclusions.

Doubtless the expenditure of 7½ million dollars on these enrockments at the entrance of a harbour of secondary importance will appear to some as an excellent example of a construction agency's losing sight of the economics of a situation in its absorption with the challenge presented by the engineering features of the problem.

Others will see these jetties as a case where the engineers became so deeply involved there could be no drawing back. They may apply this criticism particularly to the 5½ million spent after a rail outlet for the Humboldt Bay region became an assured fact and the harbour no longer provided the only transportation utility for serving commerce.

Still, others, remembering the definition of an engineer as a man who can build with one dollar what any fool could build with two, may question the quality of the engineering in this instance.

None of these opinions can be depended upon for a complete explanation. The engineering was adequate, for it solved the problem, at heavy cost, it is true, but it does not appear that any other method would have been either more economical or equally successful. Forty or fifty years ago the sea-going hopper dredgers that exist to-day, capable of operating on ocean bars, were unknown, and even if they had been, it is doubtful if such a dredger could have rectified and maintained the entrance without the aid of jetties.

The structures were originally placed to stabilise the ocean entrance of a water-way serving an immense region covered with virgin timber that had no other outlet to the world's markets. Once that construction was undertaken, there followed a considerable investment of private capital in the means of moving lumber by water—the cheapest form of transportation. Even with the advent of rail service, the prevailing standard of wages and the high operating costs made it necessary for the lumber to be transported as cheaply as possible if it was to compete with the timber products of other countries. This can be comprehended more easily if it is remembered that lumber can be shipped by steamer from San Francisco to Japan, or even Australia, for the same money required to ship it by rail 300 or 400 miles out of that city.

Another consideration that weighed perceptibly with the army men involved in this work, was the fact that there are few deep-water harbours on the Pacific Coast south of the Canadian line. A harbour of refuge is always a welcome addition to this coast. The cause of national defence was likewise served by this construction.

Admitting, as has been done previously, that the engineers were naturally disinclined to concede defeat, it is certain that they were also impressed by the fact that, in maintaining Humboldt Bay entrance, they were promoting water-borne commerce and aiding in the development of a region rich in natural

Humboldt Bay Jetties

Photo 24. Humboldt Jetties. North Jetty in January, 1934. Note wing blocks in inclined position.

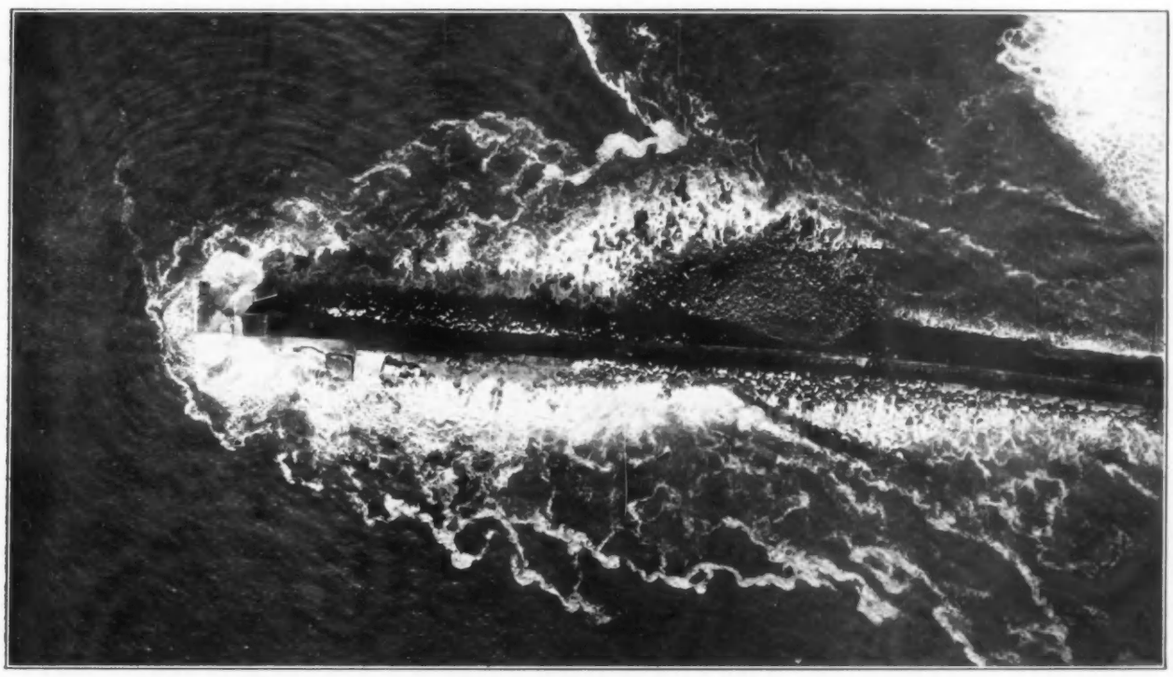


Photo 26. Humboldt Jetties. North Jetty in January, 1934. Large deposit alongside (North) of enrockment is composed of thousands of tons of stone washed out of structure periodically during winter storms prior to completion in 1925.

Humboldt Bay Jetties—continued

resources. As the engineer of 20 years ago saw the situation, the jetties *had* to be maintained. They have been and are being maintained, although at heavy cost.

There is is no doubt, in the light of long experience, that the original structures were built of stone entirely too light for the performance expected of it. This is not surprising, in view of the limited knowledge of jetty construction for Pacific Coast duty, fifty years ago, together with the then available machinery for handling heavy loads from a trestle over water.

Considering the cost of periodic trestle construction, it appears that the decision to resort to concrete was logical. If large enough stone could not be put in the structure, the answer was to build monolithic blocks in place.

For concrete work to be carried on with reasonable safety and efficiency under the prevailing conditions, it followed that an elevated working platform had to be provided on the old enrockment, hence we have the spectacle of jetties with exceedingly heavy and expensive superstructures that, standing 10 ft. to 14 ft. above *high* water, do nothing toward controlling the ebb tide—the sole purpose of the jetties! It is these superstructures, however, that hold the working portion of the enrockment together, that provide access to the entire length of the side slopes for expeditious repair operations, and that finally, as settlement takes place, may replace the present rubble mounds on which they rest.

Prophecies are unsafe for the uninspired engineer, but one may at least venture the hope that the day of heavy maintenance outlay on these jetties is past.

Scottish Harbour Notes

Dundee Harbour Trustees.

DUNDEE Harbour Trustees have decided to close down the western portion of King William IV. Dock, and as a preliminary step towards filling in the dock a rubble embankment is to be built from Dock Street to the western arm of the lockway. King William IV. Dock extends to six-and-a-quarter acres. The section to be closed extends to fully two acres, and is situated immediately to the east of the Royal Arch. At one time the busiest spot in the harbour, the dock has now fallen into partial disuse with the disappearance of the sailing ships. It is unsuited for the deeper-draughted steamer, and the section to be dispensed with is used partly as a timber pond and partly as a lay-up for sprat yawls, coal barges, yachts and motor boats. The offer of the Dundee Contracting Company, Ltd., to do the above work for £3,013 has been accepted. The embankment will be 245 ft. long and 14 ft. wide at the top, and the sides will be finished to a slope of one to one.

Meeting of Clyde Lighthouse Trustees.

At a recently-held meeting of the Clyde Lighthouse Trustees reference was made to the dredging of the lower reaches of the River Clyde. It was pointed out that the most important work which the Trustees had before them at present was the dredging of the channel. The survey, which has been completed, has disclosed the fact that silting of the channel has taken place in patches, and authority has been received to deposit the dredged material in a certain area. In the minutes of the Committee of Management reference was made to the arrangements for the hire of dredging plant. It was also stated in the minutes that the Management Committee had under consideration a letter from the Greenock Harbour Trust regarding a proposal to establish a civil sea aerodrome at Greenock. The communication was to the effect that the Greenock Harbour Trustees had been in communication with the Air Ministry regarding a proposal to establish a sea aerodrome for public use at the Great Harbour, Greenock, and they asked the Lighthouse Trustees to concur with them in the necessary application to the Air Ministry. Meantime, the Lighthouse Trustees have asked the Harbour Trust for further information; particularly with regard to the manner in which it is proposed to work the traffic.

Proposed Construction of Harbour at Portnaguran.

It is intimated that an application has been received from the fishing population of Portnaguran (Isle of Lewis) for a grant of £7,543 towards the cost of constructing a harbour at an estimated outlay of £10,750. As their own contribution they have raised by local subscription £520, and offer to give their labour free to the extent of one-quarter of the total estimated cost of the scheme. Mr. T. B. W. Ramsay, Member of Parliament for the Western Isles—in submitting the claim to the Scottish Secretary—recalls that the Walpole Commission in 1890 recommended to the Government of that day the construction of a harbour, and states that this recommendation has never been given effect to as possibly owing to the fact that—while the Government offered a grant of £15,000—the local people held out for a grant of £30,000 as recommended by the Walpole Commission. That therefore (it is contended locally) is all the more reason why the Government should now agree to the modified request.

"The construction of a harbour at this stage," proceeds Mr. Ramsay, in his memorandum to the Secretary of State for Scotland, "would greatly help existing distress caused by the failure of the fishing industry, and would enable the fishermen to take full advantage of their opportunities in the future. I have been informed that the fishermen throughout the last winter were often unable to go to sea owing to the heavy surf on the beach, but could have prosecuted their calling on the open sea. I have witnessed a great drudgery that has to be performed daily in the pulling up and the pushing away of the boats."

Portnaguran is at the point of a rocky peninsula, and has a population of about four thousand people, including fishermen and crofters.

Reconstruction Work at Fraserburgh Harbour.

Fraserburgh Harbour Commissioners had before them recently a report from Mr. Leitch (Consulting Engineer) on the damage done to the harbour structure in the storm of March last, and he estimates the cost of repair and improvements at close on £2,500. Mr. Leitch recommends a more durable covering for the surface of the South Breakwater, and suggested reinforced concrete. He also recommends that the damaged wooden roadway at the head of the North Pier be completely renewed with a concrete wall (with cope and substantial steel railing) at an estimated cost of £295. Mr. Leitch adds that the south wall of the North Pier has sustained considerable damage. In 1929 the Harbour Superintendent reported upon that work—his plan showing 490 ft. of wall requiring to be re-built, at a cost of £8,820—and 20 ft. had been patched up temporarily to prevent it falling into the harbour. If the Commissioners so desired, Mr. Leitch was prepared to produce plans for a reconstruction, which he felt should be undertaken at an early date. Mr. John Dunbar (Convener of the Works Committee) agreed that there should be a concrete wall at the head of the North Pier. He moved that a plan should be forwarded to the Fishery Board for approval, and that was agreed to.

Government Grant wanted for Portmahomack Harbour.

A notable instance of trade and agriculture being hampered for want of a Government grant is to be found at Portmahomack Harbour, Ross-shire, where the existence of adequate harbour facilities is essential for the farming and other communities. For the past five years Mr. John Fraser (Harbourmaster and Secretary of the Harbour) has been in communication at intervals with Sir Ian Macpherson, M.P., who has approached the Fishery Board, the Department of Agriculture, and the Unemployment Grants Committee soliciting a grant or a loan to remove the silt which has accumulated since 1914 and to repair the walls of the harbour. So far, however, each reply has been to the formal effect that the matter will be looked into later.

"From the fishery point of view," observed an Aberdeen newspaper when recently dealing with this subject, "Portmahomack Harbour is considered by small craft fishermen in the Moray and Dornoch Firths as the only safe harbour of refuge during an easterly gale. It gives refuge on an average to about three hundred boats during the months November to March, and it is clear, therefore, that the harbour—whether private or not—should be recognised as a harbour of refuge. Mr. Fraser (in answer to his representations for the past five years) is officially informed that the Fishery Board and the Department of Agriculture are most anxious to assist each harbour according to its importance. Evidently (as far as harbours go) the most important thing is to be in Sunderlandshire where, during the past two years, Embo, Dunbeath, Lybster and Helmsdale have had big grants, but—as far as can be ascertained—no Ross-shire port has had a grant at all. If Portmahomack could secure a grant to extend it out 300 ft. it would be possible to admit a ship at any tide, and then there would be a chance of aiding the small farmer again by the harbour having a weekly visit from the Coast Lines."

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The Port of Rotterdam

Aerial Photo] *Fig. 2. Bird's-eye View of Movable and Fixed Bridges.* [K.L.M., Rotterdam

Aerial Photo] *Fig. 3. Park-locks, giving connection with Canal System.* [K.L.M., Rotterdam

The Port of Rotterdam

By N. Th. KOOMANS, C.E., Director of the Port

Aerial Photo] *Fig. 1. Merwehaven in course of construction, 1930.* [K.L.M., Rotterdam

SINCE the appearance in Jan., 1922, in the columns of this journal, of a detailed article descriptive of the Port of Rotterdam, much has transpired. It is entirely justifiable to make use of an opportunity of once more bringing this important harbour to the attention of the readers of *The Dock and Harbour Authority*. It may be well to stress the fact that among the principal ports of North-western Europe, Rotterdam has the greatest cargo movement, i.e., about one-third of the aggregate sea cargo traffic passing through the harbours of Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp and Ghent jointly. This is explained by its location at the mouth of the Rhine, so that Rotterdam commands the bulk of the transit traffic to and from Germany, Alsace Lorraine, and Switzerland. The Rhine is navigable up to Strasbourg for vessels of about 2,000 tons carrying capacity, and to Basle for barges of 1,200 tons. Moreover, Rotterdam serves an extensive net of waterways connecting with all parts of the Netherlands and has, in course of time, attracted to itself about 50 per cent. of the country's overseas imports and exports.

The volume of its domestic traffic (1933: 7,560,000 tons of cargo) alone justifies its being counted among the leading ports. In fact, the cargoes handled for domestic consumption and shipped abroad exceed the traffic of Bremen, Havre, Rouen, Marseilles and Genoa. Then there is also the transit traffic, which last year reached 15,260,000 tons, bringing the total traffic of the port to 22,820,000 tons of cargo.

Notwithstanding Rotterdam's cargo movement consists for the greater part of bulk goods, it should also be pointed out that its traffic in general merchandise is of no mean importance. Besides bulk goods, an appreciable quantity of general merchandise is transported by water and adds to Rotterdam's port activity irrespective of prevailing adverse circumstances due to the depression. When considering, however, that the volume of goods handled has fallen from 38,450,000 metric tons in 1929 to 22,820,000 in 1933, it is clear that Rotterdam is not satisfied with its current activity, and follows with anxiety the measures taken by various governments which eventually must lead to further international trade restriction.

During 1933, vessel entries at Rotterdam totalled 15,286,000 net registered tons, of which Britain's share was 18.5 per cent.

To avoid any possible misunderstanding it is specifically stated that the foregoing figures refer solely to Rotterdam, the principal port in the New Waterway, the great mouth of the Rhine. The other nearby ports also recorded an appreciable traffic. Data as to this traffic is as follows:—

	1929 Tonnage of Vessels In thousand tons	1929 Cargo Tons In thousand tons	1933 Tonnage of Vessels In thousand tons	1933 Cargo Tons In thousand tons
Rotterdam	21,545	38,450	15,290	22,820
Other Ports	4,435	5,220	3,580	3,450
New Waterway (Total) ...	25,980	43,670	18,870	26,270

Coal, ore, grain, seeds, mineral oil, lumber and timber, metal and metal goods, and general merchandise form the main items of imports and exports. Figures for some of these commodities are given for the years 1929, 1932 and 1933; also for the total quantities of overseas cargo handled during these years, thus showing the relative importance of these commodities, as compared with the total cargo traffic.

(a) Principal commodities discharged from seagoing vessels at Rotterdam (imports destined for domestic consumption and transit goods).

Commodities	1929 Metric Tons	1932 Metric Tons	1933 Metric Tons
Ore	10,366,000	2,092,000	2,665,000
Coal, Coke and Briquets	1,602,000	901,000	900,000
Grain	3,631,000	4,300,000	3,678,000
Lumber	1,766,000	561,000	1,223,000
Mineral Oil	1,049,000	864,000	1,118,000
Seeds	225,000	306,000	256,000
Peanuts, Soya Beans, Palmpits, Copra	726,000	668,000	751,000
General Cargo	2,526,000	2,104,000	2,300,000
All other	1,109,000	504,000	809,000
Total	23,000,000	12,300,000	13,700,000

(b) Principal commodities loaded into seagoing vessels (Dutch exports and transit goods).

Commodities	1929 Metric Tons	1932 Metric Tons	1933 Metric Tons
Bunker Coal	1,900,000	706,000	816,000
Bunker Oil	58,000	53,000	77,000
Coal, Coke and Briquets	9,172,000	4,875,000	5,583,000
Metals	1,272,000	697,000	474,000
General Cargo	2,335,000	1,584,000	1,500,000
All Other	763,000	785,000	650,000
Total	15,500,000	8,700,000	9,100,000

Port of Rotterdam—continued

Financial Position: Rates.

Like other ports, Rotterdam is passing through difficult times. As a result of extensive improvements completed during the past ten years, the capital invested in the port has advanced considerably, while on the other hand the revenue has declined. It is not feasible to give any figures comparative with those of British ports, since their system of exploitation is entirely different.

Aerial Photo] [K.L.M., Rotterdam

Fig. 4. Normal situation of Sheds on the Wharf.

The Port of Rotterdam is the property of the municipality, which meets all expenses for construction works, viz.: basins, quay-walls, sites, approaches, etc. Sheds, cranes and other facilities are left to private initiative to provide.

Capital invested during the years 1870-1900 by the municipality for construction amounted to 20,500,000 florins; during 1901-1910, 21,500,000 florins; during 1911-1920, 31,000,000 florins; during 1921-1930, 48,500,000 florins*; during the period 1931-1933 about 7,500,000 florins; bringing the total figure to 129,000,000 florins. Because the harbour is of comparatively recent construction, the difference between the capital originally invested and the debts still to be met is insignificant.** The above figures give evidence of a rapid development which, until 1929, kept even pace with the increasing " entering " vessel tonnage, but not with the cargo movement.

The fact that now, less than ever, shipments are unable to bear heavy costs has compelled Rotterdam, in the face of growing burdens, to lower its harbour dues. It was realised that in these times, in addition to good service, quick despatch, etc., tariffs must also be adjusted to the bearing capacity of overseas shipping. Hence the notable reduction in harbour dues, effective July 3rd, 1933, based on the volume of goods loaded and discharged.

The influence of this for the good will be still further augmented by the lowering of the pilotage dues announced by the Government.

As for the port's budget, the reduction of dues meant a considerable reduction of income. About 10 per cent. has to be supplemented annually.

Port Extension since 1920.

Important constructions carried out during the years 1920-1933 which have changed the aspect of the harbour a great deal include:—

(a) *Extension of the Waalhaven* and increasing the number of berths for sea vessels at buoys from 39 to 82. Since the major traffic at Rotterdam constitutes direct transhipment from ocean vessel to river craft or *vice-versa*, there is first of all need for water area. The building of quays and equipment on the shore grounds will follow later as the demand therefor arises. A part of the shore grounds is available for industrial purposes. The depth of the greater part of the Waalhaven at low water is 33 feet; in places the depth is 29.5 feet and 26 feet; the normal difference in tide is five feet.

(b) *Construction of a small dock for the distribution of gasoline* on the right bank of the Maas, embracing five acres of ground for the storage of barrels, cans, etc. On ground located in close proximity to the city, storage is permissible only in underground tanks.

(c) *Construction of the Merwehaven* on the right bank of the Maas for the handling of general merchandise; quay length 13,000 feet, of which 5,750, 3,200 and 3,500 feet have a water depth of respectively 39, 33 and 26 feet at low water; harbour area 86 acres, ground area 46 acres; the quays are constructed upon heavy caissons placed on an improved ground base. Work was commenced in 1927, in dredging the basins and carrying out ground improvements (Fig. 1). For the heaviest type of walls 350 cubic feet of reinforced concrete per foot of length and 8,000 cubic feet of sand for ground improvement and ground raising were required. The cost of a wall with a water depth of 39 feet was about 600 florins per foot. The greater part of the ground space is let on long-term leases; some of the ground is still available.

(d) *Construction of an oil dock* with a water surface of 125 acres and land surface of 335 acres of which one-half is already leased. The banks are sloping, and above low water are fitted with a stone revetment.***

(e) *Improving the bridges* connecting the two sections of the city. At the point where the river is divided into two arms by an island, two bridges were built side by side, a railway bridge, and one for ordinary traffic. Those spanning the northern arm of the river are fixed bridges, those across the southern arm, originally were drawbridges.

The fixed bridge for ordinary traffic afforded less clearance than the railway bridge and thus determined the traffic by water at that point, but was, in 1927, raised by about seven feet, thus enabling both inland and Rhine traffic to pass underneath.

The drawbridge for ordinary traffic over the southern arm of the river was replaced in 1929 by a bascule bridge with a free passage width of 167 feet. The thoroughfare for vehicular traffic is 54 feet wide, that of two side-walks for passengers 13 feet. During the construction period a temporary bridge was employed (Fig. 2).

The drawbridge for railway traffic was, in 1927, changed to a lifting bridge. Traffic was maintained during the construction period. The open passage width of the new bridge is 167 feet, the height, when raised, 152 feet above low water, which can be increased later to 200 feet if necessary.

Fig. 5. Level-luffing Cranes for General Cargo.

(f) *Extension of several ferry connections*; the ferry boats have a deck space of 97 by 16 feet, also four passenger cabins. The decks are adjustable to the changing water level below that of the quay wall. Service is maintained by two boats leaving every twelve minutes in either direction.

* Of this amount 15,000,000 florins were used for land purchases.

** The budget of the port now amounts to 8,500,000 florins, of which 6,500,000 florins are for interest and depreciation.

*** An important task which precedes the dredging of a polder basin is the construction of a new embankment situated landwards of the site where the basin is to be constructed. The level of the polders is mostly one to two feet below the low water level of the river. Inasmuch as the basin is in open communication with the river, the surrounding land has also to be raised.

The Port of Rotterdam

Fig. 6a. "Stelcon" Anchor Steel Plates used to form a Roadway.

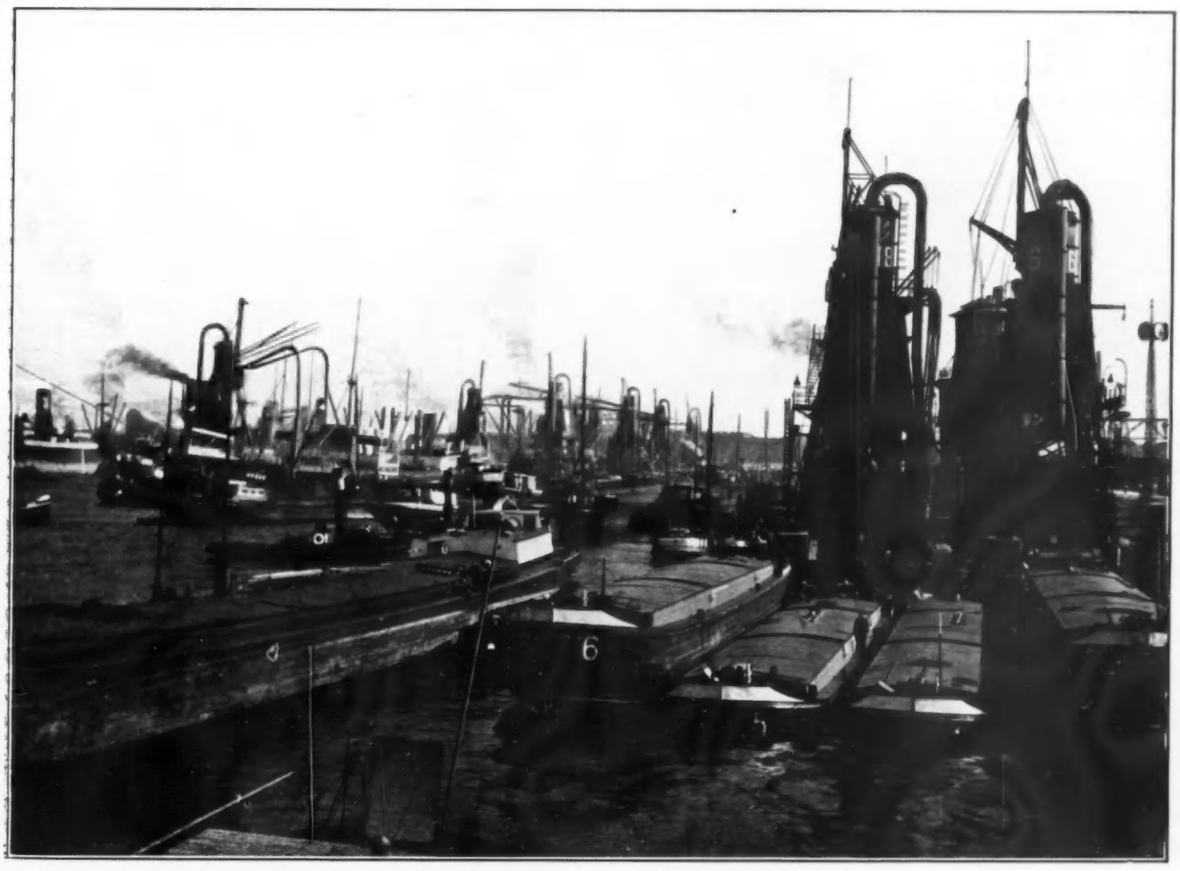

Fig. 7. Floating Grain Elevators in Maashaven.

Port of Rotterdam—continued

The number of ferry services has been augmented by one for vehicular traffic.

(g) *Improving railway connections*; all quays on both banks of the river are connected with the railway system. To improve this service, a harbour railway was built covering the southern section of the city and has now been extended to the new oil dock.

(h) *Improving the entrance to the port* comes under the jurisdiction of the Department of Public Works and Waterways of the State. The spot of least depth in the New Waterway at present is 33.5 feet at low tide. The Department is now engaged in deepening the New Waterway to 36 feet at low tide and 38 feet at high tide.

The distance from the centre of the port to the open sea is 20 nautical miles.

(i) *Communication with inland waterways* north of the city was improved. The waterways to Delft, The Hague, Leiden, Haarlem, and Amsterdam are not open waters but canals, which cut through the well-known polderland of the Netherlands. Where this system of canals meets the river, an entrance lock is needed. The old shipping route via Delfshaven, dating from the end of the 14th Century, was diverted in 1933 to the Coolhaven, which communicates with the river by two modern locks—the Park-locks. In conjunction therewith the city's canal system was improved (Fig. 3).

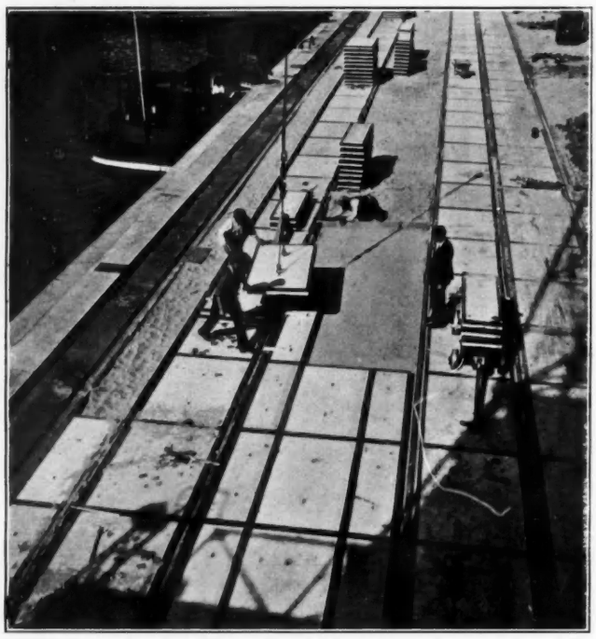

Fig. 6b. Modern Wharf Paving.

(j) *The laying out of areas for industrial purposes*; simultaneously with the construction of the Waalhaven, the laying out of areas for industrial purposes took place. Several are already in use. They are all situated on deep water and connected with the railway system. The increase of motor traffic made it necessary to pay special attention to the approaches by ordinary road.

Proposed Tunnel.

Among the construction projects now under consideration, which it is expected will soon be taken in hand, is the building of a tunnel. Due to the growth of the city—approximately 590,000 inhabitants, of whom 150,000 are on the left bank of the river—traffic across the river is steadily increasing. Motor traffic between the various parts of the harbours demands that special measures be taken. The ferries for vehicular traffic cause too great a delay and relieve but little the strain on the bridge. The most suitable point for this new means of communication is in the centre of the seaport area. Navigation is too frequent for a movable bridge. Neither is the situation suitable for a high fixed bridge; hence the plan to build a tunnel with traffic routes.

Harbour Equipment.

When considering the harbour equipment, two outstanding facts should be kept in mind, firstly, most wharves have been equipped by the lessees—accordingly there is more variety of sheds and cranes than in harbours exploited by the port authorities; and secondly, a great part of that equipment is used for direct transhipment.

Sheds.

The majority of the sheds are connected with double railway tracks. The electric cranes on the quay walls are of the portal type that span both tracks on the waterside (Fig. 4).

To this the premises of the Holland-America Line form an exception. The sheds are only separated from the water by a narrow platform and consist of two floors—a ground floor and first floor; the cranes are mounted on the roofs of the sheds, from where they can be moved.

Among the great storage plants which have been erected since 1920, the extension of the large grain elevator (silo) at the Maashaven should be mentioned. The capacity of this elevator was increased from 40,000 to 84,000 tons.

Shore Cranes.

Long after the luffing principle was brought into use in British ports, in the Continental harbours only cranes with fixed arms were to be found. When, however, cranes with rapidly adjustable arms were introduced, cranes with a very great radius came to be employed (Fig. 5).

Among the largest are the cranes for general cargo with a lifting capacity of two tons and a radius of 36 metres (four tons with 18 metres) while a range of 26 to 30 metres is considered common. Cranes with such a great reach are specially suitable for operating over a sea-going vessel with lighters and river craft alongside, of which two or three sometimes are seen lying next to each other.

The lever crane has further great advantages when working into railway cars and motor trucks. The sheds are provided more and more with roof hatches, and by means of large level cranes the goods are conveyed from the ship through the roof-hatchway directly into the shed.

Paving of Wharves.

The increasing use of electric trucks necessitated paying greater attention to paving. Since horse-traction is still employed besides motor traction, the pavement of granite cobbles or scoria bricks must be substituted for by an even road covering that is not too slippery for horses.

Two varieties of "Stelcon" paving have been used in the Port of Rotterdam. The adoption of concrete slabs equipped with "Stelcon" Anchor steel plates anchored therein has provided a good roadway (Fig. 6a). Concrete slabs equipped with a "Stelcon" steel-clad upper layer for wear and tear contained in a frame-work of angle-iron were successfully resorted to. This construction seems a cheaper solution (Fig. 6b). In the event of sinking the slabs can easily be raised. Moreover, the angle-irons on the edges make it possible to do away with railway counter-rails.

Floating Equipment and Bridge Cranes for Bulk Cargoes.

Ships tied to dolphins or buoys obviously have to discharge with the aid of their own gear, or use the floating equipment. Floating lever cranes are now often used for discharging general cargo. They are surrounded by a great many small lighters and other river craft. Grain is discharged almost exclusively by floating suction elevators (Fig. 7); for timber logs, floating cranes are also used frequently. Coal and ore are transhipped by means of shore bridge cranes as well as floating cranes. The arms of the bridge cranes reach across the water over two or three ships (Fig. 8). For direct transhipment from vessel to vessel the advantages of the bridge cranes are short straight routes which the grab has to make, while with a floating crane a rotation has to be made with every movement of the grab.

Since 1927 floating level-luffing cranes are constructed with a radius large enough for them to operate across two ships, owing to which the time needed for rotating is eliminated (Fig. 9). Owing to the fact that the basins are in open communication with each other this has contributed materially to extensive employment of floating material that can be easily moved to all parts of the port.

Lay-out of the Port.

A look at the Supplement shows that on the right bank of the Maas the docks of Rotterdam join up closely with those of Schiedam and Vlaardingen. There considerable extensions are impossible. Rotterdam expropriated in 1917 on the left bank of the Maas River some 3,700 acres of land destined for harbour extensions. It appears as if within the next ten years efforts will have to be directed towards a more intensive use of available facilities rather than to any further extensions; hence the areas reserved for extensions will not be utilised for some time to come.

An exception is formed by the area upon which an oil dock is now being constructed. The present equipment on the peninsula between the Waalhaven and the river, at first constructed in 1895, and situated at a great distance from what was then the centre of the port (the Rhinehaven had just been

PORT OF ROTTERDAM.

[HOLLAND]

GENERAL MANAGER FOR THE MUNICIPALITY: N.Th. KOOMANS C.E.

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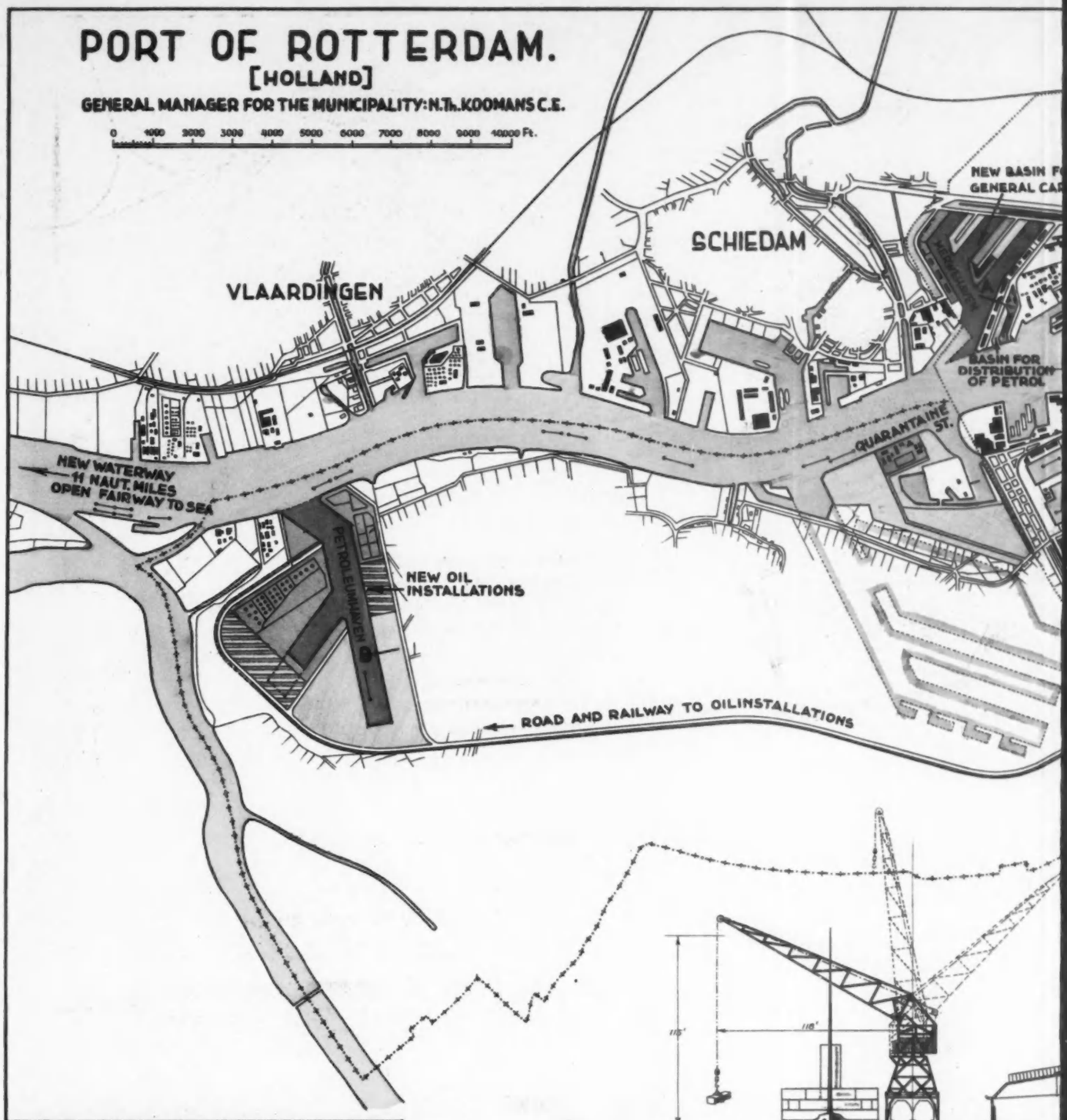

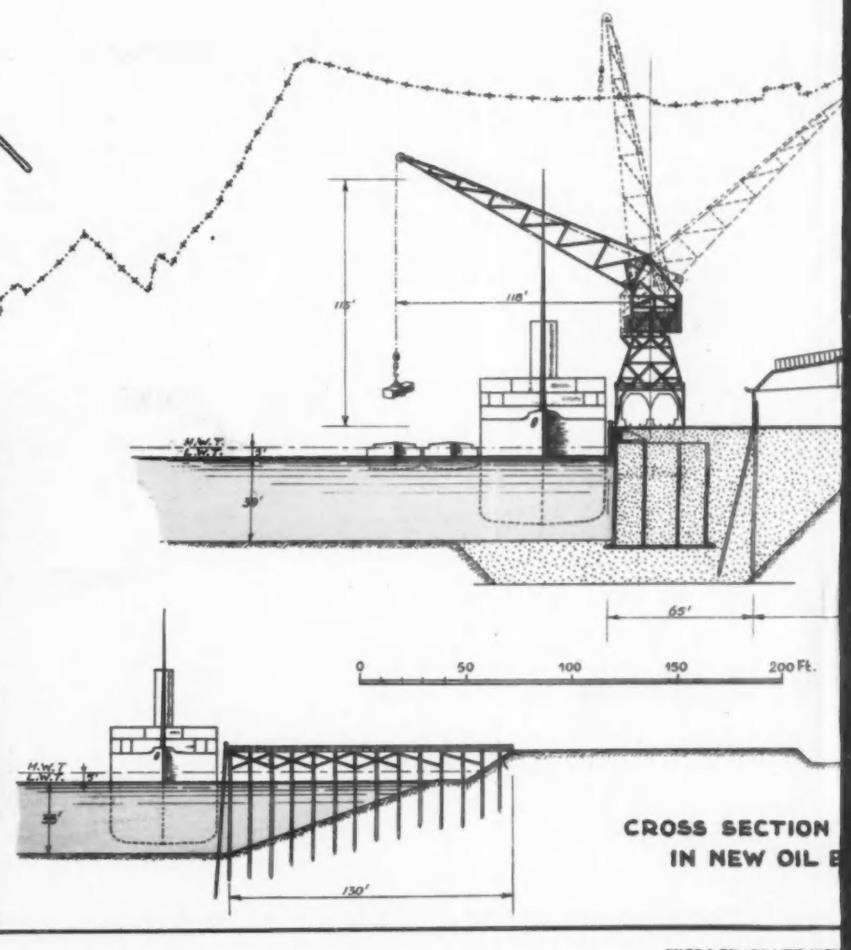

CROSS SECTION
IN NEW OIL B

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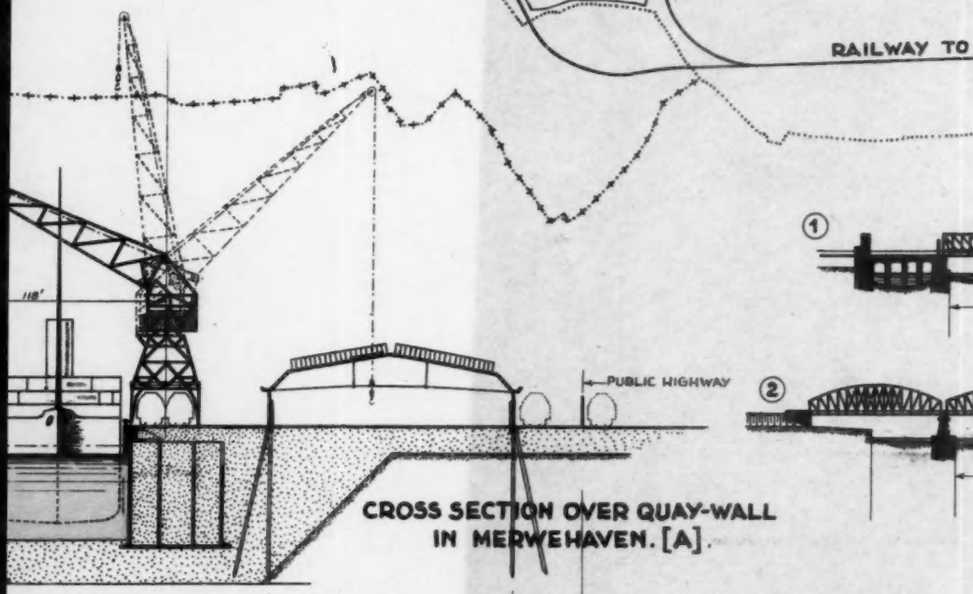
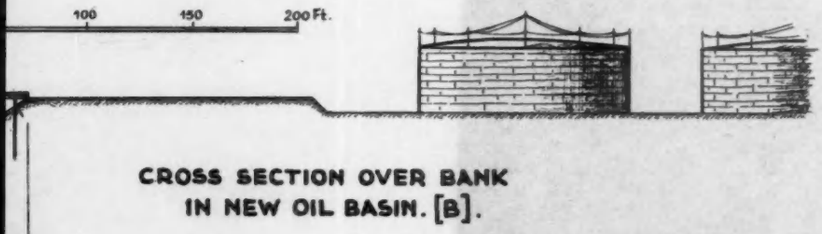
THE DOCK AND HARBOUR AUTHORITY, JULY, 193



CROSS SECTION OVER QUAY-WALL IN MERWEHAVEN. [A].



CROSS SECTION OVER BANK IN NEW OIL BASIN. [B].

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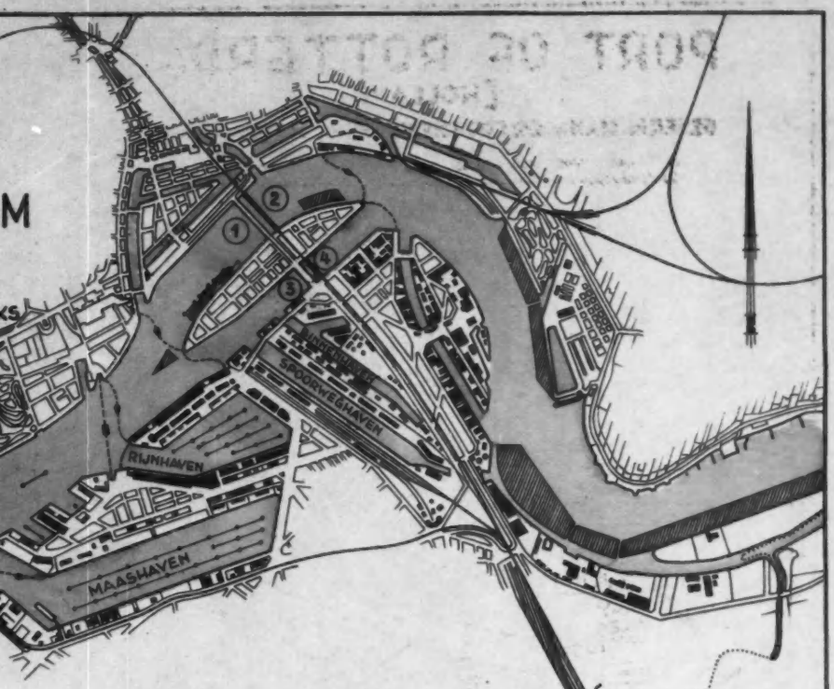
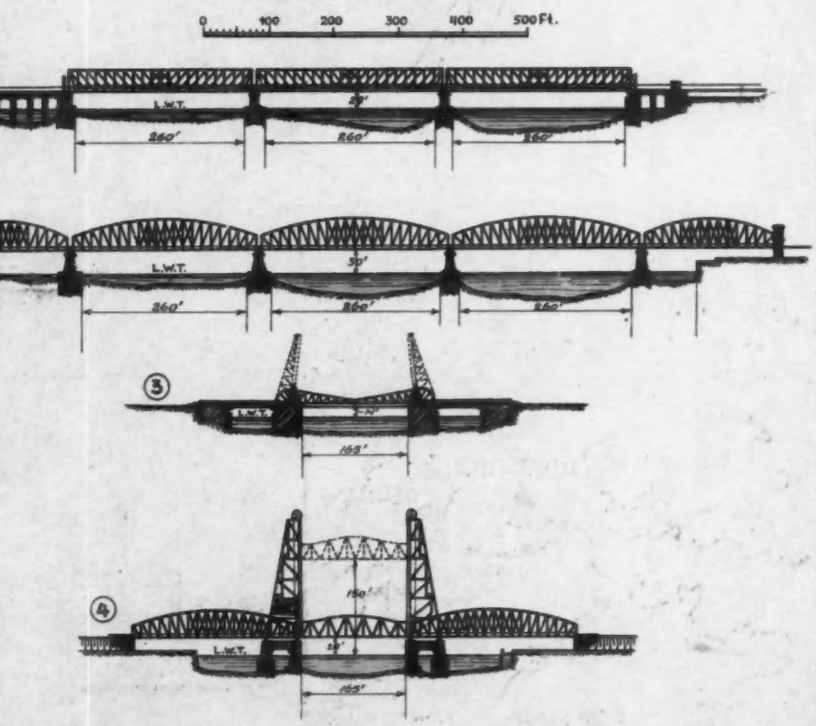


LIMITS OF MUNICIPALITY.
TERRITORY ADDED TO MUNICIPALITY IN 1934.
MOORING BERTHS FOR SEAGOING VESSELS.
FERRY BOATS FOR PASSENGERS.
FERRY BOATS FOR VEHICLES.
PROPOSED TUNNEL.
FREE ANCHORAGE, TERMINAL FOR RHINE BARGES.
FACILITIES ADDED SINCE 1920.

LWAY TO HARBOUR

BRIDGES OVER RIVER



JANUARY 1934.

PORT OF ROTTERDAM.
[HOLLAND]
GENERAL MANAGER FOR THE MUNICIPALITY: K.A. KOOMANS C.E.
ROTTERDAM
CONNECTION WITH INLAND CANALS
VLAARDINGEN
SCHIEDAM
NEW WATERWAY
NEW DOCKS
ROAD AND RAILWAY TO OILWINTAL
KEY MAP

The Port of Rotterdam

Fig. 8. Bridge Cranes for Handling Coal and Ore in the Waalhaven.

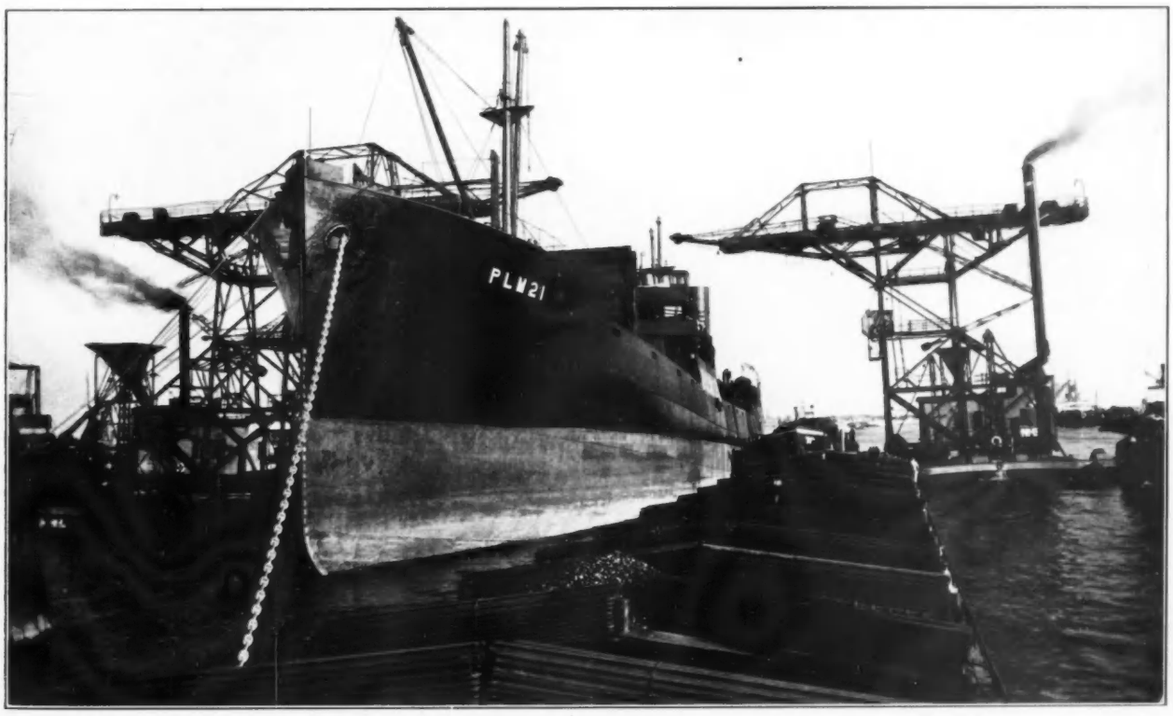


Fig. 9. Steamer loaded from Barges by Floating Cranes.

Port of Rotterdam—continued

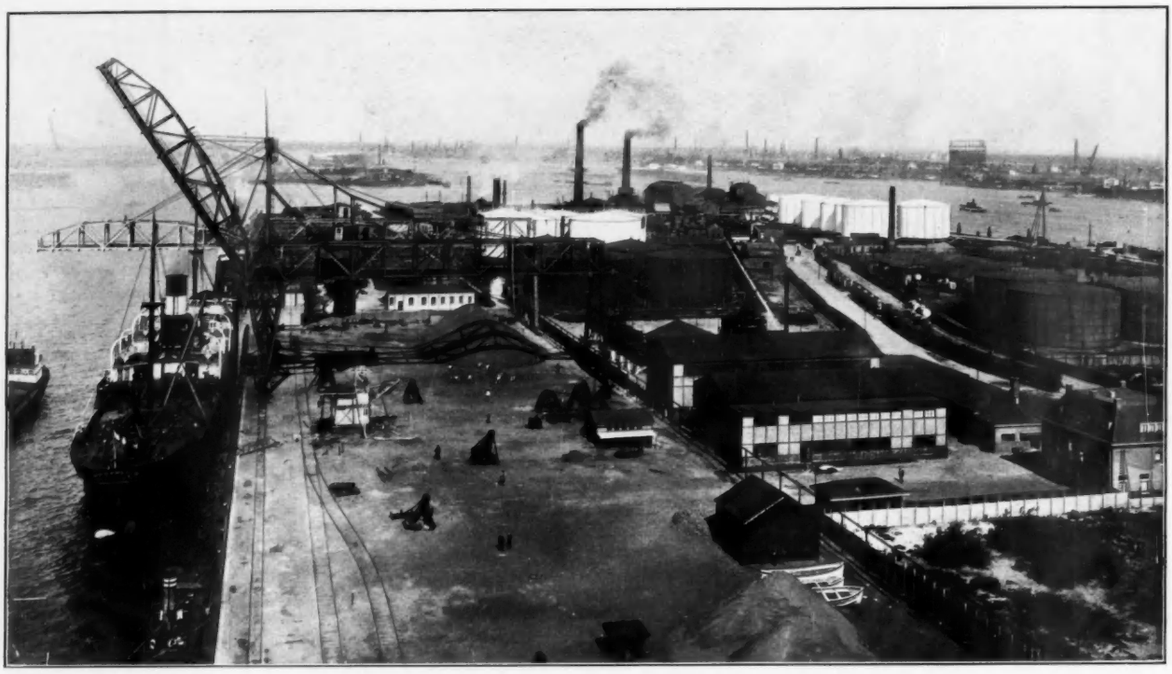


Fig. 10. Present Oil Installations to be removed to the New Oil Basin.

completed and the Maashaven projected), has gradually come into that centre in a manner which did not justify proceeding with the work there for a considerable time to come (Fig. 10).

Because Rotterdam did not sell the harbour areas to private enterprises, but only leased them out, and the leases of all oil plants expire at the end of 1935, the municipality may compel those industries now established in that centre to move to the new oil dock. Since extension of the present areas is impossible, and there are extremely advantageous conditions upon which space in the new oil harbour is available, the respective concerns have already taken up considerable ground and work thereon has been taken in hand. The space in the centre of the harbour now becoming free, forms an excellent opportunity for the establishment of industries.

Administrative Position.

By combining the various harbour services in 1932, greater uniformity in the port administration—so far as the municipality of Rotterdam is concerned—was effected. The exploitation of the municipal-owned quays, sheds, cranes, coal tips, etc., was transferred to the same authority as the leasing of quays and grounds on long terms to private enterprises, together with the harbour-master's service, and the municipal ferries and floating docks. That organisation, however, does not extend beyond the municipal boundaries.

More deliberation and co-operation with the neighbouring ports is a vital question. Commissions appointed for that purpose have submitted their advisory reports. However, the city and the port interests are so closely dependent upon each other that it is difficult to make the port independent of the city as an autonomous organisation. Since the recent revision of the harbour dues, necessary in connection with Rotterdam's international position, the port would not be able to maintain itself as financially independent without a subsidy from the municipality. The ideal of an entirely self-supporting seaport has had to be shelved until better times return, when traffic may again be able to bear heavier charges without being diverted elsewhere. A considerable part of the annual deficit is due to the burdens attached to large holdings of land for port extensions.

Rotterdam's Future.

Although Rotterdam, as with almost all other seaports, is passing through difficult times, no doubts need be entertained concerning its future.

In any event, Rotterdam is the only large port in open communication with the Rhine and the sea. No locks or bridges span communication with the sea. This gives the port a natural advantage, and although this may be hampered temporarily by political and fiscal measures, it can never be destroyed.

Irish Harbour Matters

Donegal Deep Sea Port.

At a sitting of the Commission of Inquiry into the necessity for a deep seaport for Co. Donegal, and the reorganisation of Donegal transport facilities, held at Letterkenny, Mr. Ingram, Chairman, presided.

Mr. John Curran, Letterkenny, suggested the transfer of Lough Swilly railway headquarters from Derry to Letterkenny. He alleged that timidity existed among traders using the railways, to give evidence before the Commission.

Mr. J. P. Candy, engineer, submitted a report, estimating the cost of establishing a port at Thorn, one and a half miles from Letterkenny, at £107,000.

Mr. Wm. Ball said that the concentration of all imports and exports at a central port would make its working successful. Returns based on Derry Harbour charges would be £2,600 yearly.

Mr. P. McGlenchey said that two-thirds of Donegal could be supplied through Letterkenny's central port.

Mr. Neil Blaney, T.D., felt sure that the Government would expend money on the establishment of the port if satisfied that it would be successful. Personally, he favoured Letterkenny as the site.

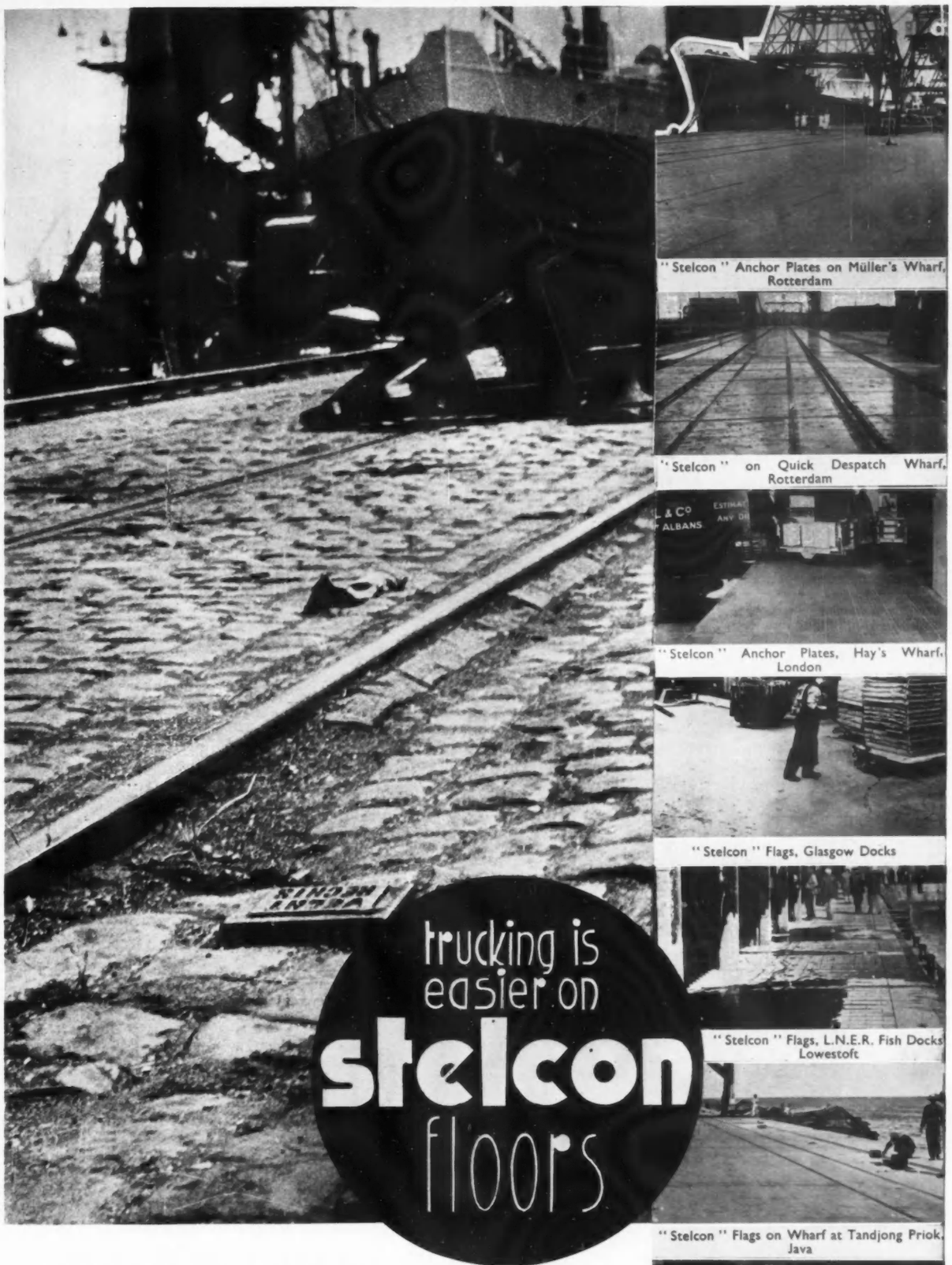
Galway Harbour Bill.

The object of the amended Galway Harbour Bill, a private measure, is to improve the harbour at a cost of slightly over £400,000. The original proposals have been extended so as to get powers to widen the dock entrance at Galway, and reconstitute the Harbour Board.

If the new provisions are acceptable to both Houses of the Oreachtas, they will be referred to the Joint Committee on the Bill, which will deal with the measure promptly. The Bill is not being opposed.

Balbriggan Harbour.

Members of the Dublin Port and Docks Board visited Balbriggan recently to inspect the harbour. The deputation included Mr. T. F. Laurie (Chairman), the Lord Mayor (Ald. A. Bryne, T.D.), and Mr. P. Belton, T.D., who were accompanied by Mr. Joseph Mallagh, Chief Engineer to the Board, and Mr. E. J. Bailey, Secretary. They were received by members of the Balbriggan Town Commissioners, the local Harbour Master and Mr. B. Griffin (Messrs. Flower and McDonald). They were shown over the Harbour and the difficulties due to silting were pointed out. A telegram was sent to the Minister for Finance seeking urgently a grant for the improvement of the harbour and the relief of unemployment.



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VAR GOD ARÉROPA "THE DOCK AND HARBOUR AUTHORITY" NÄR ANNONSÖRERNA TILLSKRIFVAS.

Interesting Legal Case

A considerable amount of interest has been taken in the North of England in a case before the Higher Courts in which the Scarborough Harbour Commissioners were the plaintiffs. The hearing before Mr. Justice Crossman in the Chancery Division in May occupied ten days and his reserved judgment has now been delivered. The claim by the Commissioners as stated by Counsel, was for a declaration that the defendants, Alderman Thomas Whitehead, a former chairman of the Harbour Commissioners, and of the Finance Committee, and Messrs. Robinson, Coulson, Kirkby and Co., Chartered Accountants, of Scarborough, were liable to them for losses caused by them by reason of the non-payment of rent by J. Sellers and Sons, Ltd., and the alleged withholding of certain harbour dues. At the material times Alderman Whitehead was chairman of the Harbour Commissioners and Messrs. Robinson and Co. audited the accounts. It was alleged that the defendant firm of auditors put forward balance sheets which showed debts of Sellers and Sons as being good debts, whereas they were to their knowledge bad. Both parties denied the allegations of misconduct. The auditors asserted that when they discovered what the position was they at once raised the matter with the Clerk to the Harbour Commissioners and insisted on a meeting of the Finance Committee being called. Alderman Whitehead, in his evidence, repudiated the suggestion that he had asked the Commissioners to show favour to him or his company and said that no attack was made on his honour until the proceedings for winding-up his company began.

Mr. Justice Crossman in delivering judgment said that Alderman Whitehead had been a member of the Board as a life commissioner since 1917, and for eleven years ended September, 1932, was chairman of the Board and of the Finance Committee. The defendant firm had since 1909 audited the Board's accounts. J. Sellers and Sons, Ltd., was incorporated in 1908 and became tenants of the Board and Alderman Whitehead was the sole director and held practically all the capital of the Company. In June, 1929, Mr. W. Robinson, of the defendant firm, became aware that Sellers' rent was in arrear and he made certain enquiries and received certain assurances. The statements Mr. Robinson made in evidence as to what he did on learning of the arrears, he (the judge) had no reason to doubt were true and he accepted them. In July, 1932, while auditing Sellers' books, he learned that the Company owed some £180 for fish dues, and a meeting of the Finance Committee was called on August 6th, 1932, when it was disclosed that the Sellers Company owed the Board a total of £351. It was resolved that the debt be written off as bad and that the Company should surrender the tenancy of its offices. The evidence was that until August 6th, 1932, the fact that the Sellers Company were in arrears for rent and gas money never came before the Board or any committee, though some of the Commissioners knew of it. But the fact that the Company owed money for fish dues was not known to any member of the Board except Alderman Whitehead.

Proceeding, Mr. Justice Crossman said there were really two separate actions, the first being against Alderman Whitehead, in which the claims, in substance, was breach of trust and duty as a member of the Board. The second being against the defendant firm in which the claim, in substance, was for damages for negligence. It was not clear to him what the effect of Councillor Jackson's withdrawal of the paragraph referred to was, but it appeared that the case against Alderman Whitehead was (1) that he did not disclose to the Board that the Sellers Company was being allowed time to pay the rent due, and (2) that the company was being allowed to retain rates or dues in respect of fish sales and that he concurred in the passing of balance sheets showing the amounts due from the Sellers Company as good debts. At the Board's monthly meetings the clerk produced a summary of the month's operations in the corresponding month of the previous year. The annual accounts were made up to March 31st each year, and were passed by the Finance Committee and certified by the clerk and the defendant firm. On the assets side was the item "sundry debtors," but no Commissioner down to 1932 appeared to have enquired by whom the outstanding accounts were owing.

Whether the Sellers' Company was a Joint Stock Company within the meaning of the relevant section of the Harbour Commissioners Act was doubtful, but in any case, said his lordship, he was of the opinion that Alderman Whitehead, as a member of the Board and the Finance Committee, in accepting each month the statement of accounts without disclosing the fact that it was known to him that the Sellers Company was being allowed to get seriously into debt, and in passing each year the balance sheet showing the Sellers debt as a good debt, amounted to such a breach of duty that rendered him liable to make good to the Board any losses that accrued to them by reason of his conduct.

In the result Mr. Justice Crossman made a declaration that Alderman Whitehead was liable and directed an enquiry as to the loss the Harbour Commissioners had suffered. With regard to the case against the auditors, the judge said that the evidence failed to establish the allegation that they accepted without comment faulty books and book-keeping as the basis of their audit or that they were negligent in regard to the fish dues arrears; but he found them negligent in regard to the arrears of rent and gas money owing by Sellers' Company. His lordship said that it was their duty to report the arrears formally to the Board and the Finance Committee, and he made a declaration that they were negligent in not making such reports and directed an enquiry as to the damage the Harbour Commissioners had suffered by reason of such negligence. The judge made an order for costs on the issues that had been proved. The Board must pay the costs of these allegations not proved or withdrawn and there must be a set-off. The costs of the enquiries would be reserved.

Notes from German Ports

Bremen's Seagoing Shipping Traffic in April, 1934.

In the month of April, 1934, according to the Statistical Office, 534 sea-going vessels arrived in Bremen harbours, with carrying capacity of 716,070 net registered tons, compared with 472 vessels with 522,666 net registered tons in April, 1933, and 521 vessels with 663,488 net registered tons in March, 1934. Vessels which ran into several Bremen harbours are only counted once. Arrivals in Bremen city harbours in April amounted to 492 vessels with 484,062 net registered tons, against 430 vessels with 350,032 net registered tons in April, 1933, and in Bremerhaven in April, 1934, 70 vessels with 238,749 net registered tons, against 62 vessels with 180,076 net registered tons in April, 1933.

During the first four months of 1934, 1,955 vessels with 2,612,722 net registered tons arrived, against 1,888 vessels with 2,135,139 net registered tons in the same period of the previous year, each vessel only noted once.

Weser River Shipping in April, 1934.

The exceptionally dry weather influenced water conditions on the Weser very unfavourably in April. It necessitated a very considerable limitation in loading and extensive lightening of barges coming from the canal to the Middle Weser. Surplus water had to be supplied from the Eder reservoir in order to maintain freight shipping. The urgent need for the canalisation of the Middle Weser now commenced is once more demonstrated.

Combined with the low-water level, this time there was also a decrease in traffic. 111,300 tons went through the Bremen Weser Lock in April, i.e., a decrease of 35,600 tons, or 24 per cent., compared with March. Compared with April, 1933, transport was 4,300 tons, or 4 per cent. less. Downstream traffic, in the month under review, amounted to 80,500 tons. Thus, compared with the previous month, it has decreased by 31,300 tons, or 28 per cent. The reduction in prices of coal and coke and the summer rebate of the coal syndicate had no effect on Weser traffic. On the contrary fuel transports decreased by approximately 11,000 tons. Potash and gravel arrivals, too, were less, grain coming from the interior was totally lacking. Upstream traffic at 30,800 tons, lost 4,300 tons, or 12 per cent. Grain, coal, flour and scrap were all shipped less. No rice or pyrites were transported. Piece goods and timber showed an increase and phosphate also went to the interior. Compared with April, 1933, there was a decrease in downstream traffic of 8,600 tons, or 10 per cent. Upstream, on the other hand, there was an increase of 4,300 tons, or 16 per cent.

During the first four months of the year altogether 510,600 tons passed through the lock in both directions, in the same period of the previous year the quantity was 399,000 tons. Goods traffic was thus 111,600 tons, or 28 per cent. more—due only to the more favourable development in the months of January-March. Downstream shipments rose at 375,400 tons by 81,100 tons. More than 30,000 tons fall to gravel and stones. The remainder is divided among potash, coals, piece-goods and cement, in addition to which larger quantities of inland grain can be added as new traffic. Upstream at 135,200 tons, there were 50,500 tons more, chiefly falling to piece-goods, coals, iron scrap and flour.

Aerial Passenger Ropeway across the Harbour of Barcelona

ENGINEERS specialising in aerial passenger ropeways, a system of transport which made rapid strides in the post-war years, chiefly in the form of mountain railways for great altitudes, were confronted by a new problem when it was proposed, in the summer of 1928, to construct an aerial ropeway to transport passengers across the harbour of Barcelona.

The seaside resort of San Sebastian, situated on the coast near Barcelona, is separated from Central Barcelona and the inland districts of the town by a wide harbour basin (Fig. 1). Communication is possible by trams or motor omnibuses, which have to take the round-about route via the suburb Barcelonetta, or by means of steamers crossing the harbour basin. The passenger ropeway was designed to avoid the detour and at the same time to establish communication with the hill of Montjuich, which overlooks the town.

The line chosen can be seen in Fig. 2. Starting from San Sebastian, the ropeway proceeds in a straight line to the Montjuich Terrace, popularly known as Miramar. For traffic to and from Barcelona itself, provision is made for an intermediate station situated exactly midway, that is on the mole of Barcelona. The total length of aerial ropeway is 4,335-ft.

The main feature of the scheme arose out of the stipulation by the port authorities that there should be an overhead clearance of 204-ft. for the passage of shipping.

Whilst the station at Miramar is situated about 165-ft. above sea level, both San Sebastian and the Mole are only 10-ft. above the normal sea level of the Mediterranean. It was therefore necessary to erect towers at both the last mentioned points (Fig. 3). Owing to the sag of the ropes and height of the suspended cars, the height of these towers had to be considerably in excess of the figure actually laid down as clearance (Fig. 4).

The foundation of the structures carrying the San Sebastian-Miramar aerial ropeway had to be put in hand first. This work, as indeed all subsequent constructional and cable-fixing work was by no means of a simple nature, involving as it did the task of laying concrete in ground subjected to the constant pressure of the subsoil water from the Mediterranean. For this purpose, several pumps had to be in continuous operation to draw off the infiltrating water. A total of 17,755 cub. ft. of concrete was used for the foundations.

After completion of the foundation, work was started on the erection of the two towers, viz., the Torre Central in San Sebastian, 230-ft. high, and comprising about 800 tons of ironwork, and the Torre Medio (Fig. 5) opposite the Estacion Maritima, the height of the latter tower being 360-ft. and comprising 1,000 tons of ironwork.

Fig. 1.

This work alone took 16 months. In view of the storms experienced in the Mediterranean during February, the erection of the structures was not an easy task. Motor-driven slewing cranes were used, and about 400,000 rivets were required. During the period of erection, access to the towers was gained by stairways only, but each tower is now provided with a double lift. In the upper portion of the Torre Central, at a height of 210-ft., a cinema and a refreshment room have been installed to accommodate some six hundred people and affording a splendid view over the Mediterranean and the beginning of the Pyrenees. In the Torre Medio, at a height of 196-ft. and 295-ft. respectively, are two restaurants with most up-to-date appointments

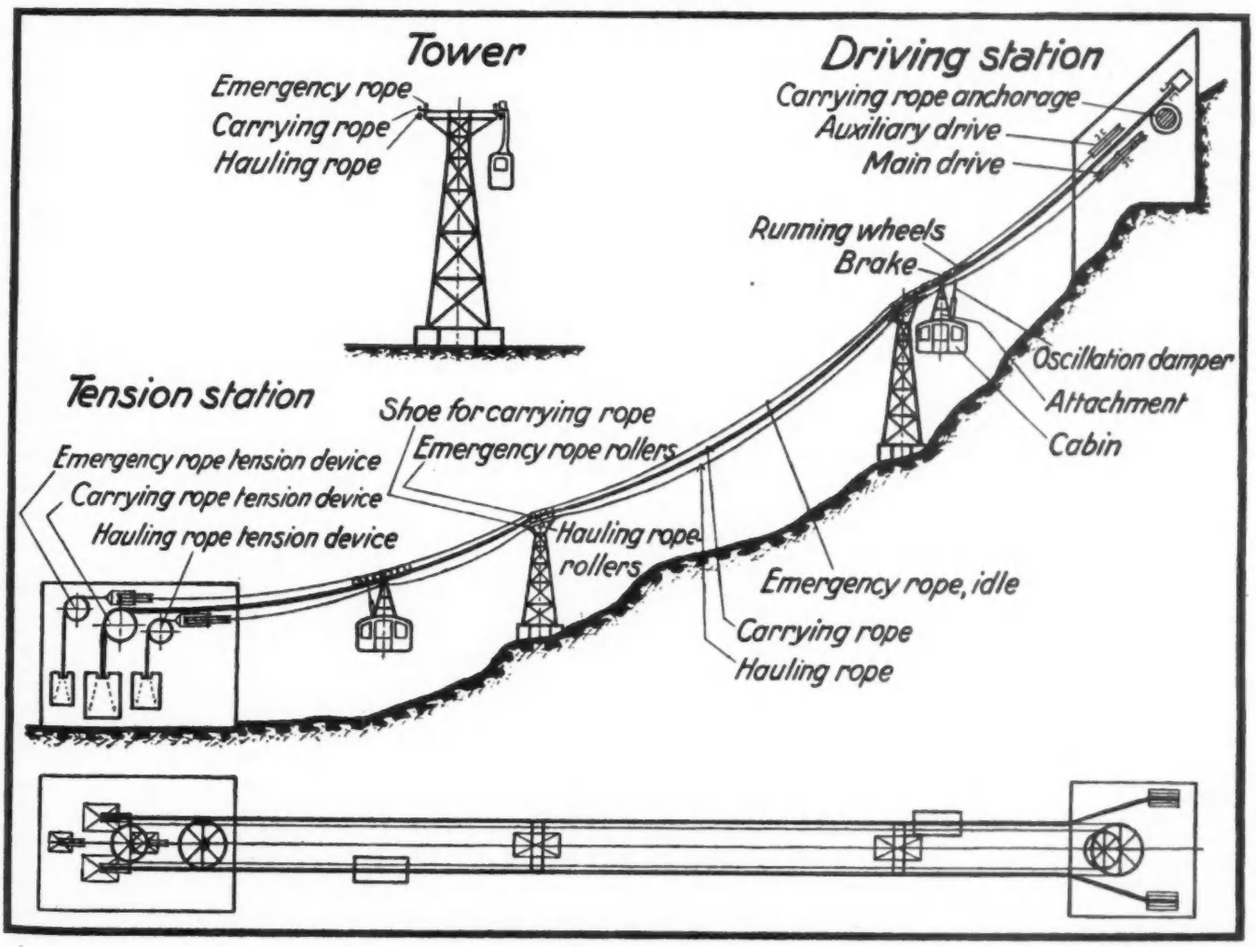

Fig. 3.

Aerial Passenger Ropeway across the Harbour of Barcelona

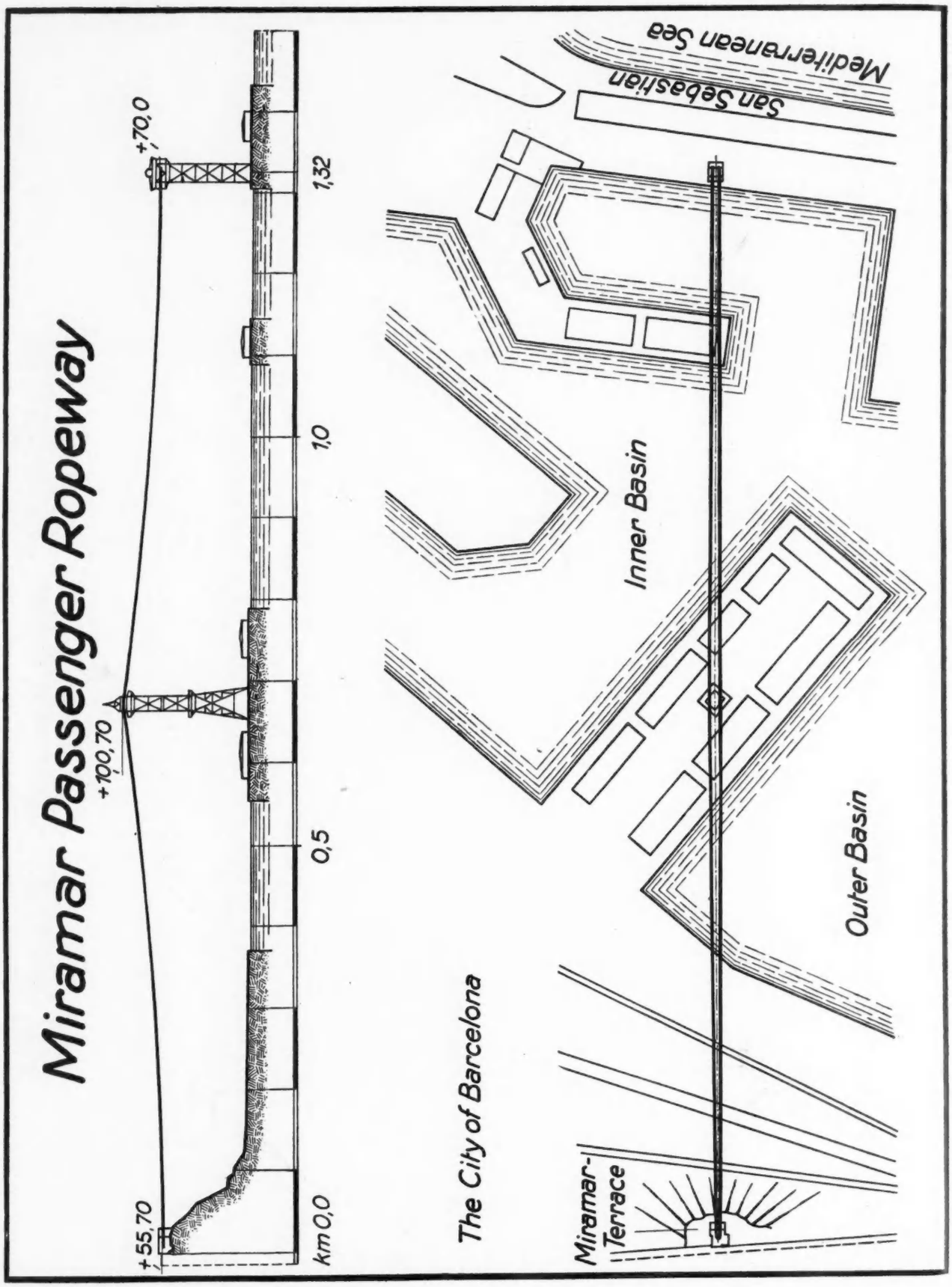

Fig. 2.

Aerial Passenger Ropeway across the Harbour of Barcelona—continued

and comfort, providing the welcome coolness needed during the very hot summer months in Barcelona. The slinging of the cables across the two harbour basins was a gigantic task and extremely difficult of accomplishment. As previously explained, the cables could not be allowed to sag below 204-ft. above water level. This work took about six weeks. In stretching them across the arms of the sea, the carrying ropes were under a load of about 20 tons.

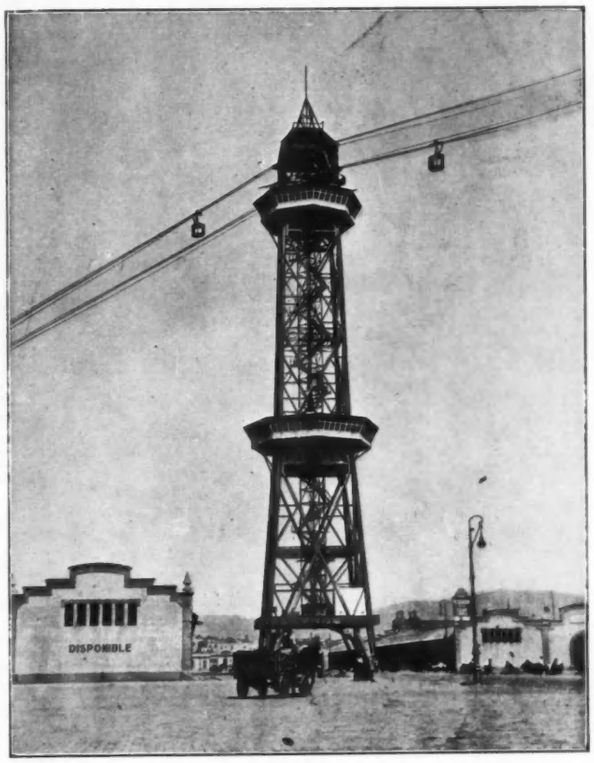

Fig. 4.

The ropeway is of the Bleichert Zuegg design. Four-car service has been adopted, so that two cars are attached to one hauling rope on either side, a span apart. Thus, at a given time, there will be two cars at the central station and one car each at the two terminal stations. The four cars, which are attached to a common hauling rope, therefore leave their stations at one and the same time. Each pair of cars pass when half the distance has been covered. The cars proceeding from the terminal stations reach the central station simultaneously with the arrival at the terminal stations of the other cars. This operation is then repeated in the opposite direction. Each car, therefore, travels to and fro between one terminal station and the central tower.

The capacity of a car is twenty passengers. At a speed of travel of 13-ft. per second, the capacity of the aerial ropeway is 480 passengers per hour. The journey between one terminal station and the central tower is a full three minutes.

The ropeway cars have eight running wheels faced with rubber to reduce wear and tear on the carrying ropes. The brake for the latter is arranged in the running gear and is automatically applied to the hauling rope in case of breakdown. It can also be operated by hand in emergency. The cabin of each car is moreover fitted with a press-button, by means of which the ropeway can be stopped in case of danger without the application of the brake. The cabins are of dodecagonal shape, which offers little air-resistance and provides the largest window space. This is of special importance since it enables as many passengers as possible to enjoy the view of the harbour, the sea and the picturesque mountains round Barcelona.

The carrying ropes are fully sheathed and are 1.7-in. diameter. The hauling rope is .9-in. in diameter, and the emergency rope, which is placed above the ropeway and intended to replace the hauling rope in case of breakdown, has a diameter of .6-in.

The whole driving mechanism is accommodated at Miramar station, which is a single-storey concrete building. In addition to the drive for the hauling rope and the drive of the emergency rope, the electrical plant, as well as a small electric stand-by power station, is housed here. The current for the normal operation of the service is derived from a three-phase A.C. supply at 220 volts, 50 cycles, to which the main motor of 60 h.p. for the hauling rope and the auxiliary motor of 35 h.p. for the emergency rope are directly connected. In case of failure of this supply, the small electric plant can be resorted to, the output of which is sufficient to cover the requirements of the auxiliary motor.

The ropeway is provided with all the safety devices prescribed by the authorities. The principal aim observed throughout was that it should be possible to deal at once with any and every imaginable type of breakdown that might occur. For example, the two electrical-driving motors have been so arranged that they can at will be made to operate either the hauling or the emergency rope. Each drive is controlled by three independent brakes: a so-called main shaft brake, operated by hand by the engineer; an electric brake, which is automatically applied if the current supply fails or if the emergency buttons or switches are operated either in the cabins or at the stations; and a centrifugal brake which automatically stops the ropeway if the normal speed of travel is exceeded. Provision has also been made to ensure that the speed of the cars is suitably reduced as they enter a station. If the driver omits to do this the cars are stopped automatically. Should the cars already running at reduced speed when entering a station be stopped too late by the driver, they run against large buffer springs which, when compressed, operate a limit switch, and the cars are brought to a standstill automatically.

Apart from the brakes, the electrical switchboard and instruments, the driver also has before him a travel indicator, showing the exact position occupied by the car at a given time if visibility is bad. Permanent telephonic communication is provided between the driver and all the stations and all the travelling cars. The current is carried by the ropes, both the hauling and the emergency ropes being insulated, the carrying ropes serving as earth.

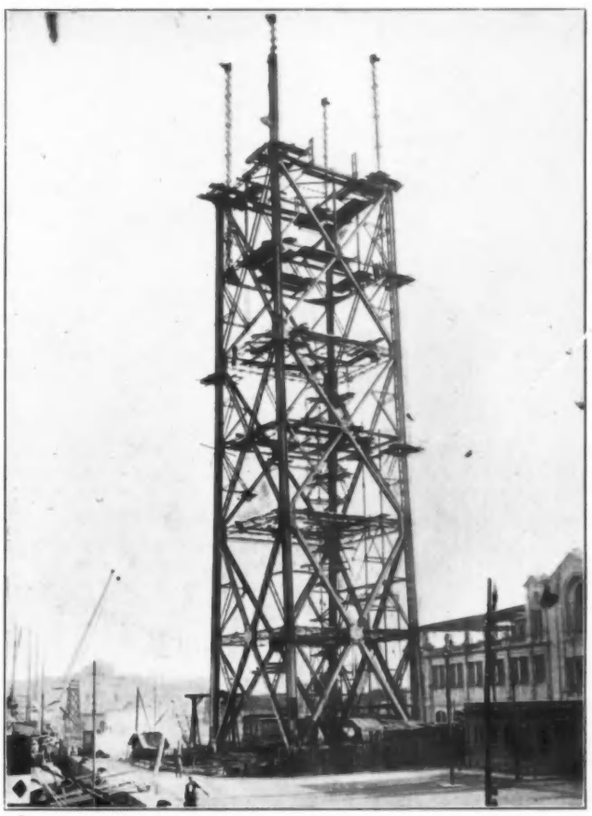

Fig. 5.

It took about 16 months to complete the plans and calculations, to lay the foundations and to erect the bare ironwork. It was not till then that it was possible to proceed with the installation of the ropeway proper. The fixing of the ropes was seriously impeded by the fact that, in order to allow a free passage for shipping, they could not be allowed to hang below a line 204-ft. above sea level, except for a few hours during a limited number of nights.

This aerial passenger ropeway is particularly attractive to the foreign visitor, as it affords a splendid view over the town and sea.

Hudson Bay: 1934 Season Commences.

The first vessel to inaugurate the 1934 season of the Hudson Bay route will leave the Tyne on July 25th. The boat, the s.s. "Dalworth," will also call at Grangemouth and Antwerp for the accommodation of Scottish and European exporters.

Italian Harbour Affairs

ACCORDING to statistics which have just been published, shipping at Italian ports during the month of May, 1934, included the arrival of 20,535 ships, representing 7,995,244 n.r.t. unloading 2,366,573 tons of goods and carrying 293,977 passengers, and the clearance of 20,071 ships, representing 7,842,229 n.r.t. with 801,905 tons of goods and 281,805 passengers, against 18,978 ships, 8,011,509 n.r.t., 2,031,678 tons of goods and 279,514 passengers arrived during May, 1933, and against 19,024 ships, 7,357,918 n.r.t., 783,350 tons of goods and 253,795 passengers cleared during the month of May, 1933. There has been a noteworthy increase in shipping at Italian ports during 1934, taking into consideration that the progress noticed during January, 1934, has continued also during the following months.

Among the most interesting features of Italian shipping during the first part of 1934 has been the increase of shipping at Trieste, which is summarised as follows:—

	JANUARY-MAY 1934	1933
	CENTALS	
ARRIVALS		
By Rail	2,658,480	1,921,804
By Sea	7,300,026	5,804,825
	9,958,506	7,726,629
CLEARANCES		
By Rail	3,541,559	2,916,466
By Sea	2,540,945	1,879,009
	6,082,504	4,795,475
TOTAL		
By Rail	6,200,039	4,838,270
By Sea	9,840,971	7,683,834
	16,041,010	12,522,104

Shipping at Trieste has shown an increase of 350,000 tons in about five months. A delegation from Austria has recently met an Italian delegation in Trieste to discuss the development of Austrian transit trade through the Port of Trieste. In the course of a speech delivered by the Austrian Minister for Commerce, he pointed out that the distance between Vienna and Trieste is about 600 km., while the distance between Vienna and the North Sea is about 1,000 km. This geographical situation—he said—which has a considerable importance in connection with the freight traffic, is still more favourable if one considers that the distance between Trieste and the East is by 2,000 miles shorter than the distance between the North Sea ports and the East. After having referred to the fact that if Austrian trade has preferred the Port of Trieste this is also due to the progress of the Italian mercantile marine, he confirmed that Austria has obtained important reductions in unloading and loading charges, as well as on warehousing charges at Trieste, and that an Austrian Free Zone with an Austrian Custom's Office is to be opened in Trieste. The Vice-President of the Trieste Chamber of Commerce stated that a special warehouse is to be placed at the disposal of the Austrian Government in the Port of Trieste for handling small parcels. The General Bonded Stores Administration has granted the following reductions to Austrian shipments through Trieste:—

(1) Shipments of coal: from 10 to 30 per cent. on all railway harbour charges on quantities from 20 to 100,000 tons.
(2) Rent of warehouses: 50 per cent. reduction on normal charges.
(3) Creation of a single charge for unloading, carriage, storage and weighing of goods; 1.80 lire per kilogramme instead of 1.95 lire per kilogramme.
(4) Charges for the carriage and manipulation of goods within the warehouses: reduced from 17 to 50 per cent.

Also the special charges have been reduced from a minimum of 12 to 25 per cent., and the free storage of goods has been allowed for a longer period than heretofore, reaching a maximum of twenty-eight days.

In connection with trade between Trieste and the Central European countries it may be interesting to consider the following figures:—

	CENTALS					
	ARRIVALS			CLEARANCES		
	1933	1932	1931	1933	1932	1931
Austria ...	1,465,611	1,093,745	1,369,405	1,465,196	2,644,945	3,802,023
Czechoslovakia	903,618	1,244,240	2,078,640	1,684,157	1,260,545	2,049,191
Hungary ...	802,890	196,079	365,010	303,288	262,614	298,239
Germany ...	153,498	166,102	248,631	794,074	691,773	700,165
Jugoslavia ...	540,901	485,520	612,390	341,942	336,531	371,093
Switzerland	1,372	997	4,365	148,392	54,759	67,036
Poland ...	68,850	181,376	286,786	37,027	92,681	251,900
Roumania ...	21,725	3,446	9,119	5,247	5,510	10,969

Shipping at Bari during the first four months of 1934 included a total of 114,058 tons imported and exported, an increase of 14,103 tons in respect to the corresponding period of 1933. The construction of a warehouse has just been started in the Port of Gallipoli, while ordinary repair work has been commenced at Taranto, Brindisi and Tricase.

After a certain period of inactivity the Sicilian shipping quarters have resumed a campaign to obtain the construction of a breakwater in the Port of Riposto, which plays an important part in the exports of wines from Sicily. This breakwater should have a length of 1,000 metres and would be built in sections.

The Port of Naples Authorities have published the figures regarding shipping at this port during 1933, and the position of the various countries is as follows:—

	DIFFERENCES BETWEEN 1933 and 1932 In Ships Arrived No.	N.R.T	In Goods Unloaded Tons	In Goods Loaded Tons
Italy	—50	+460,207	+ 63,790	+ 2,631
Britain	—15	+ 80,293	—112,510	+ 5,158
America	+ 2	+ 21,692	+ 9,655	+ 8,437
France	—43	—157,600	— 5,644	— 654
Japan	— 2	— 8,003	— 6,655	— 211
Holland	—10	— 29,832	+ 18,940	— 1,723
Germany ...	+ 9	+ 58,921	— 909	+ 2,907
Norway	+27	+ 22,127	+ 2,177	+ 1,738
Greece	+18	+ 28,117	+ 53,427	+ 750
Spain	— 4	— 9,723	+ 31,751	—
Roumania ...	+12	+ 38,993	— 3,165	+ 1,024
Denmark	+ 5	+ 7,710	— 1,546	+ 3,633
Sweden	+ 3	+ 7,062	— 7,371	— 345
Finland	+ 3	+ 951	+ 73	— 40
Russia	+ 5	+ 5,473	+ 8,341	+ 236
Belgium	+ 6	+ 7,200	+ 1,455	+ 1,632
Jugoslavia ...	+ 4	+ 1,178	— 4,283	—
Turkey	+ 1	+ 2,786	+ 3,147	—
Iceland	+ 1	+ 654	— 117	—
Panama	+ 1	+ 2,339	+ 6,216	—
Latvia	— 3	— 8,579	+ 4,350	—
Egypt	— 1	— 1,677	— 350	—
Estonia	— 1	— 392	— 200	—

The increase in the tonnage of vessels arrived is due mainly to the fact that the q.s.s. " Rex " and the q.s.s. " Conte di Savoia " have resumed calling at Naples, both on the outward and on the homeward voyage from the United States of America. The Naples Harbour Authorities are considering the possibility of assigning each particular section of the port to a particular trade in order to speed up operations.

The Italian Government has just taken up the question of the reorganisation of the Port of Porto Maurizio and of the Port of Oneglia, which were combined ten years ago into the town of Imperia, which is one of the leading markets where olive oil is exported. Though the towns have been combined, the ports are still divided. According to the project which has been worked out the breakwater of Porto Maurizio should be increased in length by 800 metres eastward, leaving an entrance of 400 metres from the head of the Oneglia breakwater. In the basin thus formed, two piers could be built with an annexed quay on which warehouses and electric cranes could be erected. The project will be submitted to the Italian Parliament in the course of October next, and as soon as the scheme is approved the construction of the works will be commenced.

Shipping at Massowah (Eritrea) during the month of March, 1934, included 192 ships arrived and cleared, representing 123,141 n.r.t. and carrying 17,360 tons of goods and 784 passengers, against 194 ships arrived and cleared, representing 76,436 n.r.t. with 7,000 tons of goods and about 1,200 passengers. There has been a considerable increase in the shipping of Massowah during the month of March, 1934, and it would appear that in order to attract a still larger volume of shipping the Italian authorities are studying the possibility of cutting down harbour charges and reorganising labour at that port.

Development of Banana Trade at Southampton.

One of the most striking features of cargo traffic at Southampton Docks in recent years has been the great increase in the banana trade.

Before 1931 little was done as regards this trade at Southampton, but in that year Elders and Fyffes made Southampton a discharging centre for the vessels engaged on the Canary Islands service. Later in the same year the Company decided that their services from Central America and the West Indies should also include Southampton as a port of call.

After a few months the Canary Islands service lapsed, but the other has gone from strength to strength and has developed to such proportions that the Southern Railway Co. last year furnished special facilities for the traffic at two berths in the docks.

During 1931, 11,532 tons of bananas were discharged at Southampton, and the following year the total went up to 17,332 tons. In 1933, however, the increase was even more striking, for no less a quantity than 1,589,701 bunches, representing 27,840 tons, were discharged.

The largest shipment ever received in one day was 90,352 bunches on July 31st, 1933.

News from all Quarters

South Africa

The traffic in the chief harbours of South Africa during the month of March, 1934, was as follows:—

	Cape Town	Port Elizabeth	East London	Durban
Number of Ships	159	60	60	141
Freight in 1,000 tons:—				
Imports	108·9	46·8	31·5	128·7
Exports	39·7	18·5	11·6	175·2
Re-exports	0·9	—	—	2·8
Total	149·5	65·3	43·1	306·7

The comparative increase or decrease in March, 1934, as compared with March, 1933, for various goods in the different ports was as follows:—

	Cape Town	Port Elizabeth	East London	Durban
IMPORTS (in Tons)				
Fuel Oil	+20,762	—	+3,727	+33,505
Wood	+6,228	+2,592	+261	+589
Corn	+3,048	—	+211	+920
Railway Material ...	−3,245	+579	+593	+1,451
EXPORTS (in Tons)				
Maize and Maize Meal ...	−32,624	—	—	−31,086
Fruit (other than citrus)	−3,545	+1,818	—	—
Wool	—	+1,414	+4,075	+1,398
Coal	—	—	—	+11,477
Ores	—	—	—	+4,910
Agricultural Products, (other than corn, wool or fruit)	—	—	—	+5,707
Corn	—	—	—	+1,086
Fuel Oil	—	—	—	+292

In the case of Durban, sales of bunker coal in March, 1934, were 7,962 tons less than in March, 1933.

Peru

The Peruvian Government has given permission to the Compania Peruana de Valores to hold a public meeting, the proceeds of which will be devoted to the purchase of a floating dock. Up to the present smaller ships have always been repaired in the works of either the Compania Francesca, the Compania Administradora de Guano or the International Petroleum Co., and medium-sized vessels at the War Fleet base at San Lorenzo where submarines are also docked. The large ships belonging to the Merchant and War Fleets had to be sent to the docks in Chile, Talcahuano or Panama, which necessitated undue loss of time and money. Consequently, sometimes only very primitive repairs were effected by sending down divers in order to minimise expenditure.

The idea of a meeting has been well received throughout Peru, aided by the Press, who point out that a floating dock is also required for the Amazon fleet.

It is hoped that the new harbour at Callao will be opened at the end of July and that it will be actually in full use by September this year. The extension comprises, among other work, the construction of four jetties.

At present there is an artificial basin with 20 ft. of water, capable of taking seven large ships at a time. The distance between the anchorage in the outer roads, of a depth of 30 ft., and the harbour basin, is about one nautical mile. There are thirty-one cranes in the harbour, of which one is for loads up to 25 tons. These cranes can deal with 1,000 tons of goods per day. During 1933, 186,447 tons of goods were imported and 45,534 tons of goods were exported through Callao, the imports mainly consisting of coal, wood, wheat, machinery and paper, and the exports of copper, cotton, wool, ores, oil-cakes, coffee, sugar, leather, horns and offal.

Belgium

It has been decided to undertake the enlargement and modernisation of the harbour of Nieuport. As soon as the necessary credits for 1935 have been voted, the work will be started.

Esthonia

Deepening operations have been proposed this year for the Esthonian harbours of Reval, Kertell and Tschorna, and also for the smaller harbour of Praaga at the mouth of the Embach. Work will be started shortly.

Jugoslavia

The Jugoslavian Finance Minister has sanctioned the preliminary expenditure of 500,000 Dinar, or about £2,270, on the construction of customs houses in the Jugoslavian free harbour zone of Salonika.

Denmark

The Copenhagen Harbour Board has just held an extraordinary meeting at which it was decided to complete the construction of a separate harbour for petrol, for which a sum of 600,000 Kronen, or about £27,300 will be required. This decision was taken in connection with the working out of a project for the re-construction of the out-buildings which already exist at the harbour entrance. The object is, that all traffic in petrol and allied substances can be dealt with separately. The cost of the whole plan, which includes the building of a bridge to the mainland, will amount to two million Kronen, or about £91,000.

Latvia

The Port Department has proposed to the Marine Department that in certain places the harbour of Windau shall be deepened so as to make it serviceable even at low tide. Other improvements to this harbour are also proposed.

During the first quarter of the current year, traffic through the harbour of Libau, amounted to 116 incoming and 109 outgoing ships, of which 32 carried the Latvian flag, 28 German and 56 others.

Imports and exports (both including through goods) were as follows:—

	IMPORTS (in Tons) Jan.-March 1934	IMPORTS (in Tons) Oct.-Dec. 1933	EXPORTS (in Tons) Jan.-March 1934	EXPORTS (in Tons) Oct.-Dec. 1933
Corn and Seeds*	2,563	957	390	442
Herrings	833	1,854	—	—
Salt	800	1,725	—	—
Coal and Coke	23,707	19,525	—	—
Fertilisers	700	300	—	—
Wood	—	—	13,628	6,244
Matches and other Wooden articles	—	—	553	532
Various	6,607	5,057	169	184
Total	35,210	29,418	14,740	7,402

*The export figures for this include oil cake.

U.S.S.R.

In a speech which he recently made, Mr. Bronstein, head of the Baltic section of the Merchant Navy, stated that he was anticipating a considerable increase in the traffic of the harbour of Leningrad in the coming months. He estimated that in place of 1,935 ships which used the harbour in 1933, there would be 2,300 ships in 1934. A very important passage in his speech was, that the Harbour Board are planning to build, during 1934, a new section of the harbour, actually on the island of Turuchtany, to deal with the exports of potash.

Among other constructional alterations which are to be made to the harbour of Odessa, it is proposed to build a wharf exclusively for the shipping of wood, the export of which over the Black Sea, it is intended to concentrate in Odessa.

Finland

During the first quarter of the current year, the traffic of the harbour of Helsingfors amounted to 267 incoming and 259 outgoing vessels. Details of the goods carried are as follows:—

IMPORTS (in Tons)	
Piece Goods	39,955
Corn	2,264
Coal	2,660
Various	1,727
Total	46,606

EXPORTS (in Tons)	
Paper and Pulp	41,213
Sawn Wooden Goods	10,172
Rafters	26
Wooden Supports	2,610
Piece Goods	11,766
Various	619
Total	66,406

The work which was commenced in December, 1933, by the Sandvikens Skeppsdocka och Mekaniska Verkstad A.B., of Helsingfors on the construction of a dry dock in Helsingfors (West Harbour) has now been completed. The first ship to use this dock was the "Petsamo," belonging to the Elfving fishing fleet. The length of the dock is 429 ft., the width 65 ft., and the depth of the water 21½ ft. It is capable of taking ships up to 11,000 tons, or, in other words, any vessel which can dock at Helsingfors. It is equipped with one 75-ton and two 4-ton cranes.

Further, the floating dock built in Abo, which has been in use for the past month at Helsingfors is working entirely satisfactorily.

News from all Quarters – *continued*

Danzig

The figures for the imports and exports of goods during April, 1934 (in comparison with April, 1933), for the harbour of Danzig, are as follows:—

IMPORTS (in Tons)

	April 1934	April 1933
Seeds ...	688	2,019
Cocoa ...	74	180
Pickled Herrings	611	996
Iron Pyrites	—	4,481
Other Ores	524	7,187
Animal Fats and Oils	664	1,453
Pig Iron	18	140
Small Shot	808	1,217
Coffee	290	216
Phosphorites	8,765	—
Wool Yarn	68	35
Iron and Steel	2,021	402
Various	19,401	18,059
Total	33,932	36,385

EXPORTS (in Tons).

	April 1934	April 1933
Rye	43,002	7,311
Barley	10,813	6,668
Wheaten Flour	8,516	276
Coal	324,520	199,239
Timber for Sawing	67,029	45,875
Oil Cake	449	225
Wheat	1,466	2,630
Leguminous Plants	2,351	3,691
Bacon	109	144
Lubricating Oil	993	7,934
Fuel Oil	—	40
Paraffin	761	1,464
Zinc	352	652
Sugar	87	424
Various	104,606	41,852
Total	565,054	318,425

The total imports for March, 1934, amounted to 34,558 tons and the exports 418,389 tons. Taking the figures for the first quarter of 1934 in comparison with the first quarter of 1933, there was an increase in imports of 18,977 tons and an increase in exports of 467,387 tons.

India

Statistics concerning the imports and exports of the harbours of Kathiawar have only just been published for the year 1932/33. Imports were as follows:—

	£
Chemicals	97,500
Fruit and Vegetables	97,500
Mechanical Equipment, etc.	157,500
Iron, Metals and Ores	472,500
Sugar	577,500
Raw Cotton	1,072,500
Cotton Cloth	90,000
Yarn and Fabrics (other than Cotton)	135,000
Various	405,000
Total	£3,105,000

The three chief harbours in this district are Bhavnagar, Navanagar and Okha. When the extension of the harbour of Bhavnagar, which is being carried out by a Dutch firm, is completed, there will be a definite increase in the traffic of these harbours.

Canada

In a report of the chief engineer of the Saint John (New Brunswick) Harbour Commission, it is stated that traffic through this port in several leading commodities during the first four months of the current year exceeded the volume of shipments of these commodities for the corresponding period of last year, as will be seen from the following table:—

	January-April 1934	January-April 1933
Motor Cars and Accessories	48,200 tons	21,186 tons
News Print	37,982 ,,	6,172 ,,
Soft Wood	30,129,486 feet	12,443,444 feet
Hard Wood	18,405,518 ,,	9,197,520 ,,

U.S.A.

Work on the construction of five new 1,100 ft. piers at the ends of 48th, 50th, 52nd, 54th and 56th streets in Manhattan has made considerable progress. The first half of this undertaking, consisting in the construction docks for 48th, 50th and 52nd streets, will shortly be completed. On completion this dock will be used to house the new French steamer "Normandie," which is over 1,000 ft. in length, and which is due to make her maiden voyage early in 1935. The total cost of this large-scale undertaking, inclusive of the purchase of ground, amounts to 20 million dollars (about £4,000,000).

A plan has been made for the construction of a series of goods stations (of which the central station for piece-goods will be the first) to facilitate the exchange of goods between the existing terminal stations in New Jersey and the new Manhattan docks, and at the same time to collect at one spot goods from the eight railway lines.

The long-delayed question on the creation of a free harbour zone in New York Harbour has recently been re-discussed. Mayor La Guardia is in favour of the immediate adoption of this plan, and he has proposed to the public Works Administration in Washington that a sum of 90 million dollars (£18,000,000) be voted for this purpose. The City Council has the support of both the "Shippers' Conference of Greater New York" and "The Merchants' Association of New York" in the adoption of this plan. On the other hand, however, the "Maritime Association of the Port of New York" points out that any facilities and advantages which would accrue from a free harbour zone, are already provided for under the Customs Tariff Law of 1930.

In any case, the draft of a bill, presented by the New York Deputy, Mr. Emanuel Celler, for the permission to create free harbours in the United States, is at present before the Senate and will be examined by a special committee of the Senate.

Rumania

The following are the statistics for the exports of goods through the port of Braila during the month of May, 1934:—

	Tons
Wheat	264
Maize	3,751
Barley	10,901
Beans	5,257
Peas	599
Chickpeas	587
Mustard	274
Millet	183
Lentils	138
Hemp	189
Pumpkin Seeds	20
Sunflower Seeds	776
Bone Dust	102
Bone Waste	10
Constructional Wood	5,760
Total	28,811

These goods were all dispatched to European ports and also to Turkey and Algeria.

Guatemala

The imports for the year 1933 through the harbour of Livingston (figures of which have only just been published) amounted to 2,820 tons, of which 1,680 tons came from the U.S.A. (of which 535 tons were coal), 530 tons from Mexico consisting of petrol and oil, 385 tons from Germany and 144 tons from Great Britain. Exports of coffee amounted to 4,420 tons, and of bananas to the U.S.A. 405,606 bushels. Apart from coffee and bananas, only 9½ tons of other goods were shipped from Livingston.

Imports through the other main Gautemalan and Salvador ports (Pto. Barrios, San Jose, Champerico and La Union) amounted to 72,118 tons, the most important goods being:—

	Tons
Wheaten Meal	14,773
Gasolene	11,717
Petroleum	7,877
Cotton Goods	4,488
Iron Goods	3,831
Cement	3,493
Crude Oil	2,695
Provisions	2,409
Lubricating Oil and Fats	2,068

Exports of bananas through Pto. Barrios amounted to 5,200,000 bushels, and of coffee through all the ports together amounted to 65,779 tons. Other goods exported were:—

	Tons
Honey	981
Hides	530
Wood	129
Ores	277
Sugar, etc.	785

China

During the first quarter of 1934 there was very little change in the amount of business which took place in the harbour of Shanghai. The total value of imported goods during this period amounted to £11,837,298, and of goods exported to £4,129,358. Of necessity the amount of goods exported from China in the first quarter of a year are, comparatively speaking, small, because her main exports consist of agricultural products, the shipping of which is dependent on the times of the harvests.

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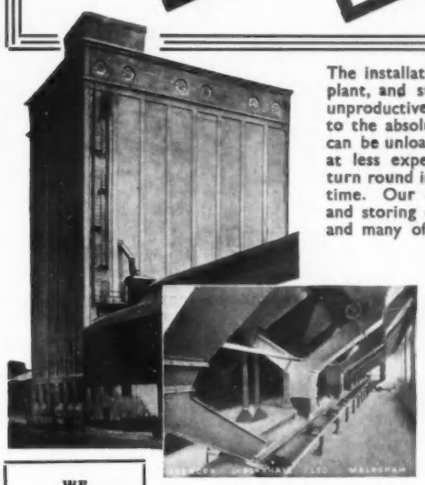

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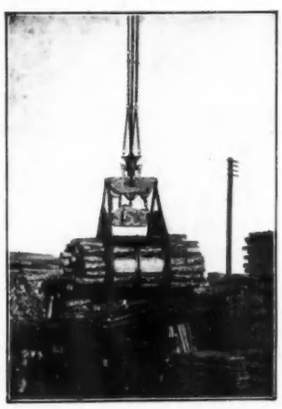

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CHALK
ASPHALT
BALLAST
BEET-ROOT
BRIQUETTES
COTTON-SEED
OVERBURDEN
TOWN-REFUSE · LOCUST-
BEANS · HEAVY-STEEL-SCRAP
BLENDE · CEMENT · CLINKER
CINDERS · GRANITE · PEBBLES · PEAT
ROCK · SALT · SAND · SILT · SLAG
SOOT · ZINC · EARTH · GRAIN · MAIZE
OXIDE · SLUDGE · RUBBLE · SHINGLE
SLURRY · IRON-ORES . LIMESTONE · PHOSPHATES
BITUMEN · PITCH · PIT-PROPS · LIME · GRAVEL
GYPSUM · CORAL · AMMONIA · MACADAM · MUD
METAL-TURNINGS · BOULDERS · DETRITUS · SHALE
SHELL · PYRITES · WHINSTONE · ETC.

SI PREGA FAR MENZIONE DEL "DOCK AND HARBOUR AUTHORITY" QUANDO SCRIVETE.

Bombay Port Trust

Before proceeding with the regular business on the agenda of the meeting held on the 22nd May, 1934, the Trustees adopted a resolution expressing their deep regret at the death of their former colleague, Mr. Lalji Naranji, who was a prominent member of the Board from June, 1922, to March, 1933.

A Government Notification appointing Mr. L. Wilson to be a member of the Board of Trustees *vice* Mr. A. E. Tylden-Pattenson, proceeding on leave, was recorded.

The election by the Chamber of Commerce of Mr. G. C. Phillips as a member of the Board of Trustees *vice* Mr. E. C. Reid, granted leave, was recorded.

A supplementary estimate amounting to Rs.13,827 was sanctioned for conversion to general use of a special type of flat barge originally purchased in 1925 for use with the Dipper Dredger "Walrus."

With reference to the Bill, now before the Legislative Council, which proposes to amend the Bombay Municipal Act in respect to assessment of water charges on Government properties, the Trustees approved a draft letter to Government expressing their apprehension that the substantial loss to the Municipality in water revenue which would be caused by the proposed reduction in the charges levied against Government, would in all probability be made good by enhancing the already penal charges levied on large consumers, such as the Port Trust, the Railways, Textile industry and Trade generally. The Trustees pointed out that past experience had shown that whereas the Municipality have always refused to raise the water rate on residential properties fixed at 3¾ per cent. of the rateable value (equal on an average to a little over two annas per 1,000 gallons) irrespective of the quantity consumed, they have had no compunction in raising the charges levied on the large consumers on meter measurement at from 10 annas to Re.1 per 1,000 gallons, the actual cost of the water to the Municipality being only about 3⅛ annas per 1,000 gallons. The Port Trust at present pay 14 annas per 1,000 gallons, the rate having been more than doubled in the last 12 years; their annual water bill amounts to over Rs.3¾ lakhs a year, and having regard to present financial and trade conditions and recent increases in Municipal taxation, the Trustees view with grave concern the prospect of any further enhancement in water charges. In these circumstances the Trustees submitted that the amending Bill should not be proceeded with, or alternatively that the relative clauses should be omitted, pending further consideration of the whole question.

At a meeting of the Trustees of the Port of Bombay held on 5th June, 1934, the Chairman announced that, subject to final audit, the accounts for the financial year ended 31st March, 1934, had been closed, and the result of the year's working was a deficit of Rs.89,879 in the General Account, as against an anticipated surplus of Rs.27,759 in the Revised Budget Estimates prepared in January last, the difference being mainly due to reduced receipts from wharfage on cotton exports during the closing months of the year. The Pilotage Account closed with a surplus of Rs.92,350, so that taking the port as a whole the result of the year's working was practically an equilibrium between receipts and expenditure. The expenditure on General Account showed a reduction of Rs.4.65 lakhs, as compared with the original budget.

The election by the Indian Merchants' Chamber of Mr. Vithaldas Damoder Govindji *vice* Mr. Gordhandas Goculdas Morarji, granted leave, and by the Bombay Chamber of Commerce of Mr. A. K. G. Hogg *vice* Mr. W. M. Petrie, resigned, as members of the Board of Trustees, was recorded.

The Board accepted the quotation of the Callender's Cable and Construction Co., Ltd., amounting to Rs.10,117 for laying new underground electric cables in Alexandra Dock and accorded approval to expenditure estimates as follows:—

Rs.7,746 for paving footpaths and constructing carriage entrances in front of residential plots on Apollo Reclamation, the buildings on which are either completed or will be completed before the end of this year.

Rs.18,642 for renewal of the full length of the Messent Road railway fencing by steel pale fencing with concrete posts.

Great Britain: Revised Docks Regulations, 1934

Form 1949, June 1934 — Notice to Dock Occupiers, Stevedores, Shipowners and Masters

The above Regulations came into force on the 1st June, 1934, in place of the Regulations made in 1925 for the safety of persons employed in loading and unloading at docks, wharves and quays.

The majority of the Regulations in the revised code are identical with the Regulations of 1925, but certain additions have been made after discussions between representatives of the employers and workers concerned and the Home Office. Nearly all of these alterations were made in order to bring the Regulations into line with the Draft International Labour Convention, 1932, concerning the prevention of accidents at docks. The principal new requirements are as follows:—

Under Regulations 18 to 22, certificates of test on prescribed forms are now required not only for chains, rings, hooks, shackles and swivels and for wire ropes, but for all classes of lifting machinery and gear before it is taken into use in connection with the processes. The prescribed forms are as follows:—

Certificate of test and examination of—	
Winches, derricks and accessory gear ...	Form 1944
Cranes or hoists and accessory gear ...	,, 1945
Chains, rings, hooks, shackles and *pulley blocks*	,, 86
Wire ropes	,, 87

The above must be attached to the Register of Machinery, Chains, etc., and Wire Ropes (Form 99).

The test loads to be applied and the conditions of the tests are specified in the Schedule to the Regulations, and set out on the above forms.

Certificates of the periodic annealing of chains, rings, hooks, shackles and swivels are now required in a prescribed form. They must either be given in Form 1946 (which must be attached to the Register) or be entered in Part IV. of the Register. Under powers given by Regulation 19 (b), the Chief Inspector of Factories has exempted certain classes of chains and fittings from annealing, subject to certain conditions. Particulars are given in the Register and in Form 1946.

The tests and examinations must be made by competent persons and the annealing must be carried out under the supervision of competent persons. Under Regulation 21, a person will not be deemed to be a competent person if and in so far as the Chief Inspector of Factories gives notice in writing that such person is, in his opinion, not technically qualified for the work. There is a right of appeal to the Secretary of State, whose decision is final.

Regulation 29 provides that every crane and derrick (not only every shore crane) shall have the safe working load plainly marked upon it.

In connection with Regulation 37 dealing with the protection of hatches not in use, provision has been made under Clause (d) of the "Duties," for a stevedore or other person carrying on the processes to give written notice in the prescribed form (Form 100) to the owner, master or officer in charge of a ship when he has completed the processes at a hatch. Thereupon the duty of complying with Regulation 37 as regards that hatch rests upon the owner, master or officer in charge of the ship.

Regulation 41 requires reasonable measures to be taken to guard against accident in connection with the stowing and unstowing of cargo.

Regulation 44 requires safe means of transport for persons who have to proceed to or from a ship by water for the purpose of carrying on the processes.

Placard copies of the Regulations (Form 938) must be kept affixed in conspicuous places at factories, docks, wharves and quays to which they apply, and the register and certificates mentioned above must be kept available on such premises and on board ships loading or unloading at docks, wharves or quays in Great Britain.

Copies of the Regulations and other forms mentioned above may be obtained from H.M. Stationery Office at the addresses given below. The prices are as follows:—

Regulations (S.R. & O., 1934, No. 279)	4d. each.
Placard (Form 938)	2d. each.
Forms 1944, 1945, 86, 87, 1946 ...	1d. each, 100 for 2/-
Register (Form 99)	9d. each.
Form 100 (book of 60 notices) ...	6d. each.

The Government of Northern Ireland has made corresponding Regulations and prescribed corresponding forms. The forms prescribed under the British Regulations will be accepted in Northern Ireland, and the corresponding forms issued in Northern Ireland will be accepted in Great Britain.

Home Office, Whitehall,
London, S.W.1.
1st June, 1934.